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STEEL

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As the Editor Views the News

■ LAST WEEK'S unprecedented upsurge in steel demand, which carried the production rate up 12 points to 74 per cent of ingot capacity, was accompanied by intensified expansion in all sorts of activities. At least ten blast furnaces (p. 24) have been added to the active list. Twenty-five additional iron ore carriers are being commissioned at lower lake ports and the lake shipping season is to be extended into December. Demand for many raw materials has been accelerated. Beehive coke ovens long idle again are in production. The railroads feverishly are reconditioning track and equipment. Machine tool plants are moving into 24-hour operation. Shipbuilding is being sharply stepped up. The amazing feature is that practically all of the huge current demand is from domestic sources.

• • •

No Steel Shortage

Reassuring development was the reaffirmation, on Thursday, of existing steel prices through the fourth quarter. This action, plus the evident intention of steelmakers to take care of their customers under all circumstances, tended to allay fears of a steel shortage such as developed in the World war boom. With this in mind, leading steel companies are endeavoring to pursue a "wise" course with reference to new business, particularly for export; in some cases no export orders are being accepted. While the steel companies themselves thus are retarding inflationary tendencies, those tendencies are developing in many other directions—in raw material prices and the cost of living. Hence steel prices are regarded as likely to be advanced early in 1940.

• • •

Prices on Uptrend

Principal price changes last week (p. 131) included advances of $20 on ferromanganese, $2 on pig iron, $2 to $3 on scrap; other manganese and tungsten alloys also are up and certain ores appear slated for higher prices. . . . The important question as to how we will act as a neutral nation will be the chief issue (p. 33) in the session of congress called for Sept. 21. But many other matters of concern to business also may come up, as our policy with reference to scrap exports. . . . Now available is a new process for producing molds and dies (p. 29) by electroforming iron against patterns to be reproduced. . . . Last week's orders (p. 27) included one for steel cabinets for 12,247 kitchens; they will require 4000 tons of steel. . . . The upturn in employment (p. 26) discloses a shortage of skilled workers.

• • •

Steel's Capital

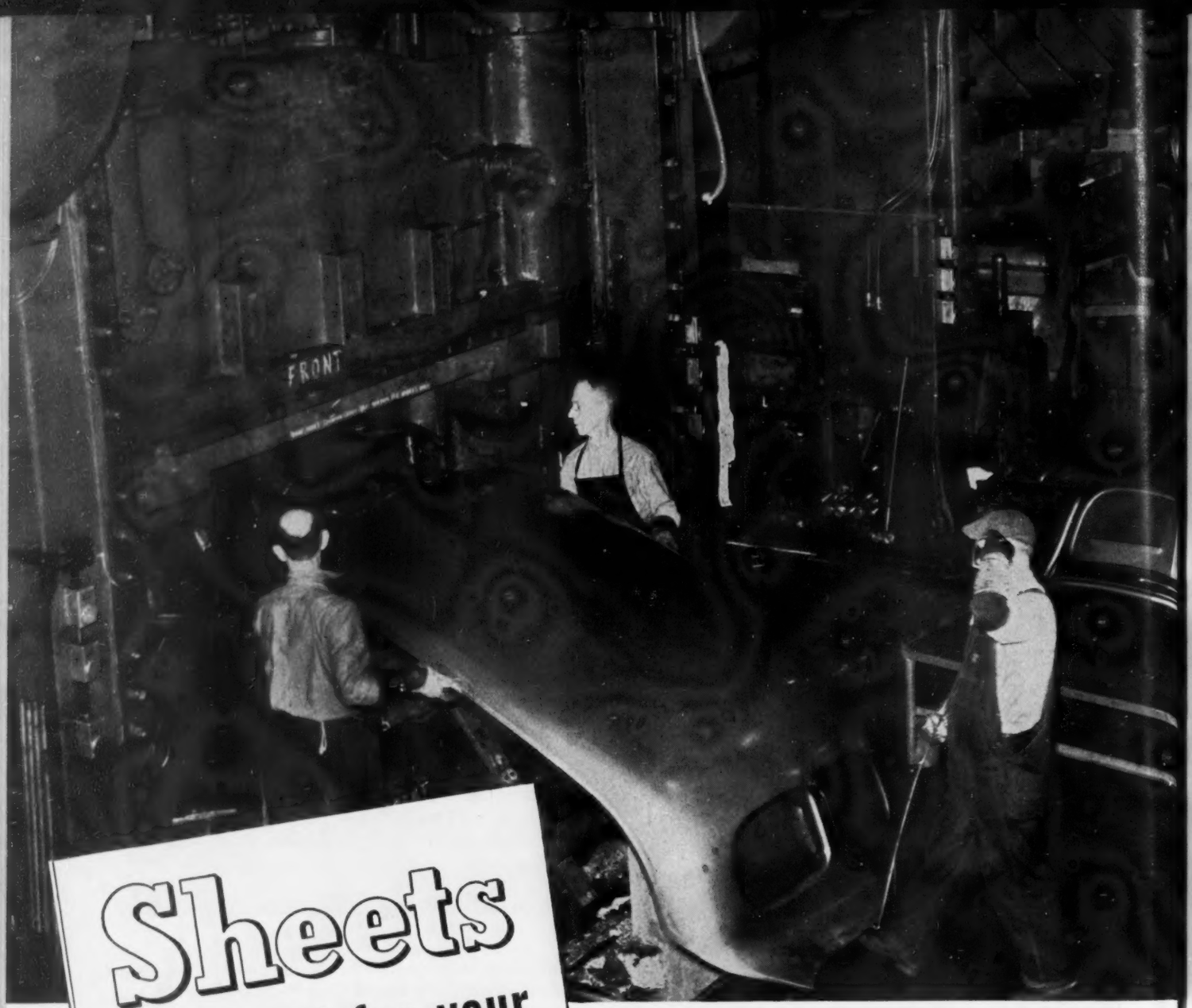
In previewing the thirty-fifth annual convention and exposition, Association of Iron and Steel Engineers, STEEL presents (p. 81) a unique map of the Pittsburgh district. Steel's capital, this district contains 27 per cent of the country's total ingot capacity, while Pittsburgh is headquarters for the managements of nearly 50 corporations that represent 55 per cent of the nation's capacity. In other words, Pittsburgh now is the industry's policy making center. . . . Extremely flexible operating controls (p. 44) have a vital bearing on recent tonnage records set up on continuous strip mills, both hot and cold; such controls in Republic's 98-inch mill are described. . . . New machines (p. 64) facilitate flame hardening of teeth of large gears with uniform results.

• • •

Safety in Handling

Tantalum coils (p. 50) are being used increasingly to heat pickling tanks. They eliminate acid contamination, permit stronger acid concentration, higher pickling speeds, economical use of fuel, effective temperature control. . . . An authority discusses (p. 58) correct methods of using wire rope slings in safely handling large, awkward objects by crane. . . . Electrochemistry has made great gains during the past decade (p. 116) and more than 1000 electric furnaces now are in use in the United States. . . . A new lifting tractor (p. 118) handles welded strip coils weighing up to 25,000 pounds. . . . Important new developments are reported (p. 119) in steelmaking refractories. . . . Three new alloys (pp. 120, 126 and 129) recently have been developed.

E C Kreutzberg



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SHEETS STRIP TIN PLATE BARS PLATES FLOOR PLATES STRUCTURALS PILING RAILS TRACK ACCESSORIES REINFORCING BARS

Steel, Metals in Vanguard as Industrial Tempo Quickens

■ QUICKENING in activity along most of the industrial front continued as the war in Europe entered its third week.

Steelmaking operations rose 12 points to 74 per cent of capacity. Indications are for a further advance this week.

At least ten blast furnaces have been added to the active list. Pig iron demand is the heaviest in years and an iron shortage is considered possible.

Raw materials demand is accelerating rapidly. Coal mining activity has increased and mines have called back some furloughed employes. Railroad and power plant inquiries are better and have driven in some hesitant business.

Long idle beehive coke ovens in the Connellsville district are being placed in operation.

Ore carriers are being commissioned at lower lake ports. Twenty-five are expected to be added to those already in service and the season will be extended.

Railroad and equipment builders recalled workers to recondition rail equipment. Some sizable orders and inquiries for new equipment and rails were reported. The Pennsylvania railroad announced a $17,000,000 expansion program. Truck manufacturers are revising production schedules upward.

Shipbuilding program of the United States maritime commission was speeded up by rush inquiries for 33 new cargo vessels.

Aircraft, engine and partsmakers, with a $335,000,000 backlog, will step up production schedules. Deliveries now estimated at $18,000,000 monthly will reach $25,000,000 monthly by year's end.

Machine tool activity continues to gather momentum. Many plants are reported operating on a 24-hour basis to cope with an inflow of both domestic and export orders. Deliveries in some cases are being extended into 1940.

Anticipated shortage of highly skilled labor appeared. Tool builders especially reported a shortage of good machinists. Country's reservoir of ten million unemployed persons, however, precluded a general labor shortage. Considered for revival are the "vestibule schools" of World war days.

Inventories are being expanded. Rush to cover requirements has caused deliveries on some products to be extended into next year.

Finished steel prices through the remainder of the year were reaffirmed. Current quotations will apply on all tonnage shipped by Dec. 31. Shipments after that time will be invoiced at prices in effect at time of delivery.

Raw materials prices generally advanced. Scrap rose

Trend of Prices and Steel Production Since 1913

■ **Price line represents annual averages of STEEL'S composite of 25 principal iron and steel products. Production line is per cent of capacity engaged in making ingots and steel for castings as reported by American Iron and Steel institute**

$2 a ton at leading centers, despite apparent absence of mill demand. Ferromanganese increased $20. Pig iron was raised $2.

Export steel prices have advanced further to around domestic levels. Foreign inquiries continued active and export departments often found facilities swamped. Some divisions are reported to be two weeks behind on entering orders already received, despite increased personnel.

Further stimulus to export business may result from the President's action in calling congress to reconvene Sept. 21 and possible repeal of the arms embargo, with "cash and carry" provision.

With France and Great Britain estimated to have a combined total of $7,000,000,000 or more in assets which could be converted to dollar balances for buying American goods and sufficient bottoms to transport such purchases, an increase in sale to the belligerents is considered certain—should the embargo be lifted.

115,000 Tons of Rails Placed; Finished Steel Prices Extended

■ CONTINUED heavy influx of business, price increases on pig iron and certain ferroalloys and an extension of current quotations on finished steel products marked the second week of the accelerated activity that has gripped steel markets since the outbreak of the European war.

Steel plant operations have experienced one of the sharpest upturns in history. Heavy backlogs assure a continuation of brisk schedules through the fall; it is not improbable fourth quarter ingot production will be the largest on record for that period.

Iron ore shipments are being speeded. Beehive coke ovens, usually idle except in emergency periods, are being pressed into service in the Connelsville, Pa., district. Additional blast furnaces and steelmaking units are being prepared for operation.

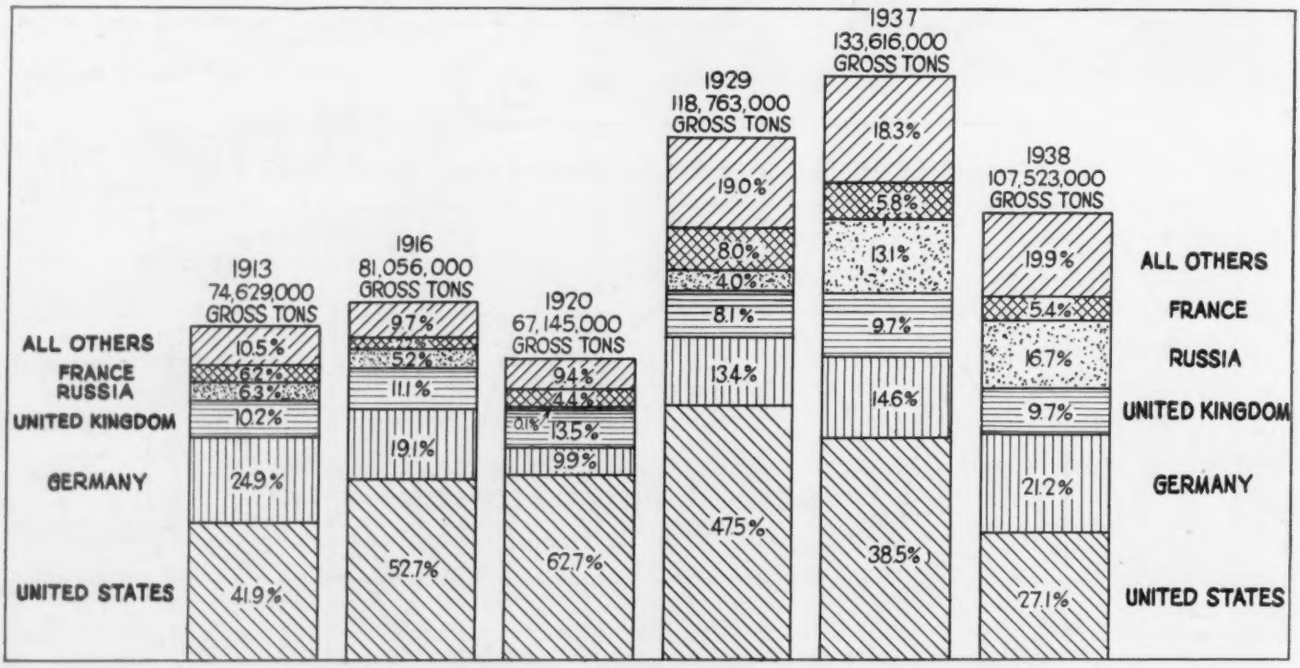
Buyers' fears that steel prices promptly would follow soaring markets in nonferrous metals, iron and steel scrap, grains and some other commodities were calmed Friday when a United States Steel Corp. subsidiary released the following statement:

"Carnegie-Illinois Steel Corp. announced today reaffirmation of its present prices on hot-rolled carbon and alloy steel bars, plates, structural shapes, steel sheet piling, hot and cold-rolled sheets, hot-rolled strip and standard rails for shipment up to and including December 31, 1939, for delivery and consumption in the United States. This announcement states that the prices apply on such shipments as are made up to and including December 31, 1939, and that any shipments after that date will be invoiced at the prices in effect at time of shipment."

A similar announcement by American Steel & Wire Co. extended present prices on hot-rolled rods, manufacturers' wire, cold-rolled strip and commodity strip. Tin plate producers previously had reaffirmed current quotations.

Meanwhile, export markets were flooded with inquiries, but actual business from abroad was relatively light. A shortage of available boats continued to impede foreign trade. Export inquiries are coming principally from neutral countries, one exception being what is regarded as a "feeler" from the British government on 200,000 tons of steel, principally semifinished. This inquiry was cabled as no official buying agency has been established in this

World Steel Production in Key Years



■ How the world's steel picture has changed is graphically depicted above. United States in 1920 accounted for 62.7 per cent of total ingot and castings output; last year only 27.1 per cent. World demand in the peak wartime year, 1916, required but 81,056,000 tons, while during 1937, a fairly prosperous peacetime year, 133,616,000 tons of steel was needed. German Customs Union, which included Luxemburg, Alsace-Lorraine and the Saar, in 1913 and 1916 turned out 24.9 and 19.1 per cent respectively of world production, while in post-war 1920 Germany proper accounted for only 9.9 per cent, recovering subsequently to 21.2 per cent last year

country. Plans are reported under way to set up a central board representing domestic steel producers for the handling of export business.

Improvement in domestic demand has been widespread, its most encouraging aspect being the extent to which heavy steel products have shared in the revival. This results to a large extent from a marked increase in railroad orders and inquiries for track material and equipment. Plate and shape demand for shipbuilding also is heavy.

Rail orders last week totaled 115,000 tons, including 20,000 tons for Brazil. Freight car awards of 3000 are believed to be only the forerunner of a large number of such orders. Pending business in rolling stock, much of which has not yet come out for bids, is estimated the heaviest in ten years. Outstanding in railroad programs is a $17,000,000 expenditure planned by the Pennsylvania railroad. This involves purchase of 2500 freight cars, 20 locomotives, 3 new passenger cars, 15 modernized passenger cars and 50,000 tons of rail. These rails are in addition to 30,000 already on order. In addition, 17,500 freight cars and possibly 1100 locomotives will undergo repairs.

Rising prices on raw materials, in addition to a $2 advance on most grades of pig iron, include ferromanganese, spiegeleisen, fluorspar, tungsten ore, silicomanganese and manganese briquettes. Foreign ore prices remain to be established but are heading upward. Iron and steel scrap quotations soared $2 to $3 a ton last week in churning markets.

Heavy grades of fuel oil, widely employed in open-hearth furnaces have been advanced ¼ to ½-cent per gallon.

(For further details see market section beginning page 131.)

Rush Inquiries for 33 New Cargo Vessels Speed Shipbuilding Program

■ STEEL requirements for shipbuilding were raised last week as the United States maritime commission stepped up its merchant marine rehabilitation program sharply. Originally calling for 50 ships a year for ten years, vessels placed or pending already exceed this year's quota.

"Exercise of foresight," as one official expressed it, has prompted the commission to prepare for emergency needs resulting from the war. First action was an invitation last Monday for bids for 20 C-2 cargo vessels, to require 92,000 tons of hull and superstructure steel. Bids will be opened Sept. 19, just eight days after specifications were issued. This speed is made possible by builders' familiarity with C-2 specifications.

Tuesday the commission called for bids by Sept. 20 for construction of 13 additional new ships, to require 60,500 tons of steel. Six are C-3 type for the commission's own account and will require 30,000 tons steel; four for American Export Line will take 20,000 tons; three for Seas Shipping Co. will take 10,500 tons.

Ahead of Quota

Since the ten-year program was launched last year, the commission has placed for its own account 103 vessels, 55 in 1938 and 48 so far this year. Bids will be opened Sept. 20 for a C-1A merchant ship which will require 4000 tons of hull steel. Five C-1 ships are expected to be formally awarded to Sun Shipbuilding & Dry Dock Co., Chester, Pa., soon.

Earlier this year, commission placed 14 C-3 ships. Six went to Newport News Shipbuilding & Dry Dock Co., Newport News, Va.; four to Sun Shipbuilding & Dry Dock Co.; and four to Ingalls Iron Works, Birmingham, Ala.

Fifteen C-1 vessels recently were awarded Bethlehem Steel Corp., five to be built at Sparrows Point, Md., five at Staten Island, N. Y., yards, and five at the Union Iron Works yard, San Francisco. Other C-1 boats placed include five to Tampa Shipbuilding & Engineering Co., Tampa, Fla.; five to Federal Shipbuilding & Dry Dock Co., Kearny, N. J.; four to Consolidated Steel Corp., Los Angeles; five to Western Pipe & Steel Co., San Francisco.

In addition to the rapid acceleration of cargo ship construction, substantially more navy work than was anticipated will be out for figures before the year ends. Tanker building may be expanded.

Both maritime commission officials and shipbuilders, however, hope to avoid over-expansion of capacity or accumulation of too much tonnage. They recall that at the end of the World war in 1918 the United States had on its hands hundreds of vessels built within two years. This tonnage acted as a drag on shipbuilding as replacements were not immediately needed. Recently the ships have been becoming rapidly obsolete, to the detriment of the merchant marine.

Merchant marine position of the United States now is not comparable with that at the outbreak of the World war. Admiral Emory S. Land, maritime commission chairman, says the United States has 300 vessels available for operation in foreign trade, or more than three times the number available in 1914.

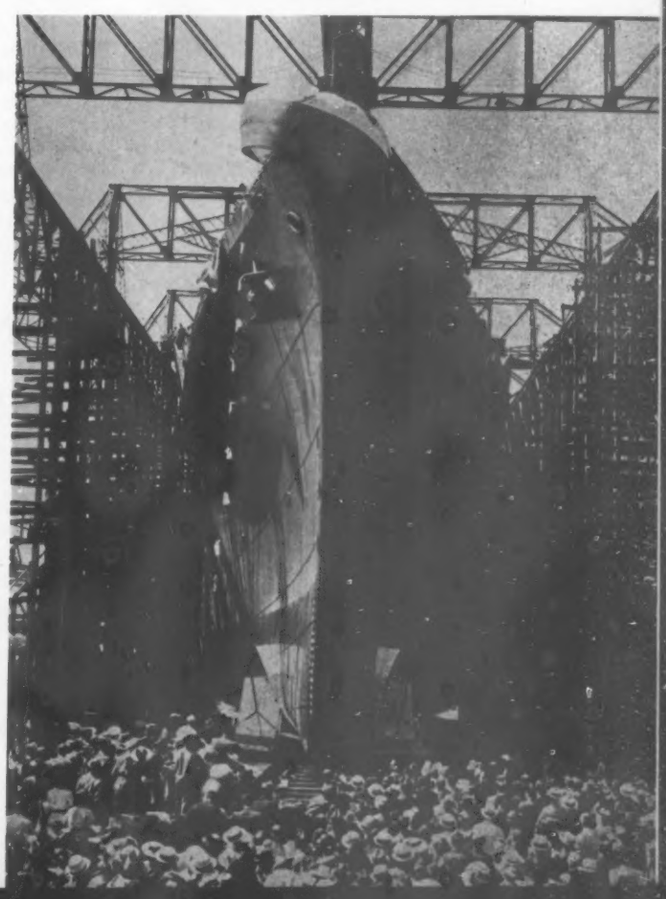
LESSON FROM THE PAST— "WAR PROFITS ILLUSION"

That all parties concerned will be the losers in the present war was the warning issued last week by E. J. Kulas, president, Otis Steel Co.,

◆

America's Largest Ship

■ **Largest merchant vessel ever built in this country is the 30,000-ton luxury liner "America," launched recently by Newport News Shipbuilding & Dry Dock Co., Newport News, Va. Costing $17,000,000, ship is 723 feet long, has 92-foot beam, will accommodate 1219 passengers. Entering transatlantic service for United States Lines next spring, she is to symbolize the nation's drive for maritime eminence. Wide World photo**



Cleveland. Writing in company's employe magazine:

"The idea that business makes money out of war is a fallacy. Any profits made on war orders are a drop in the bucket compared to the losses which business suffers on the day of reckoning which inevitably follows.

"This is just as true of the steel industry as it is of any other industry. Steel depends for its progress, its payrolls and its profits upon the peace-time prosperity of the country. The major business of steel always has been that of supplying a basic material for the machines and devices that do the work of the world.

"The present European picture is an international catastrophe. Even though the conflict should be brief, it has already involved a tremendous economic waste through the diverting of millions of men from useful, everyday occupations into military activities, for which the whole world, including the United States, will have to pay."

Workers Recalled, Hours Increased; Skilled Labor Shortage Threatens

■ UPTURN in industrial employment has uncovered the anticipated deficiency in highly skilled workers, but little possibility of an acute general labor shortage such as was experienced in the early years of the World war.

Virtual abandonment of apprentice training in many cities during the depression and relocation of once-skilled men in other lines of work have made the trained worker the bottleneck of the labor picture. Especially has the shortage been felt by machine tool builders, first to benefit in the current upsurge. With many shops operating on capacity or near-capacity basis, toolmakers had met considerable difficulty in finding suitable operators.

Railroads called back several thousand workers, most of whom had been furloughed earlier in the year. Railroad shops experienced a sharp increase in activity as reconditioning of equipment in preparation for heavier traffic, both actual and anticipated, was ordered.

Common labor, of course, is readily obtainable and may be trained rapidly to fill semiskilled jobs. Approximately ten million unemployed persons assure an ample reservoir from which to draw—as long as the United States does not actually enter the war.

With a few exceptions, employment rolls have been expanded only moderately. Furloughed workers have been recalled. Hours worked by old employers have been raised to the standard 40-hour limit and in some cases overtime is being worked.

Where new workers are being added, employers generally are proceeding conservatively, selecting men carefully. Wholesale additions to payrolls are being avoided until industrialists are able to appraise the situation more accurately.

Reason for this caution, of course, is found in the new responsibilities an employer is required to assume for employes. As one industrialist put it, hiring a new man has taken on many of the aspects of getting married. If the apparent boom suffers an early collapse, forcing the release of newly hired employes, the employer must continue to contribute to their support through higher unemployment compensation taxes. For this reason, limited overtime for old workers sometimes is preferred.

Continued quickening in activity over the next 60 or 90 days will force large additions to employment rolls.

War Department Establishes Forty-Five Procurement Offices

■ FORTY-FIVE district procurement offices have been established by the war department as points of contact with industry in developing plans for mobilizing industrial resources for national defense. The officers in these procurement districts are furnished by the Washington office with schedules of the type and quantity of products desired from manufacturing establishments in their districts.

Appropriations for the war and navy departments were substantially increased this year. At the same time congress set aside $14,250,000 for use this year for educational orders. A similar amount is expected to be made available next year. Contracts not only for the new educational orders program but also for the larger and more continuous requirements of the rearmament program now under way will be placed to a large extent through these district offices.

Since the educational orders program contemplates production of noncommercial items and often calls for unusual equipment and plant facilities the greater part of expense on such contracts will often be for the necessary preparatory planning and work.

Each firm receiving an educational order will be expected to develop a complete and detailed plan for the efficient quantity production of a particular item. This will include the design of special machinery, tools, jigs, gages, and the like needed in the manufacturing process and procurement of at least one sample of each item. In addition the contractor will be expected to manufacture a sufficient quantity of the designated item to thoroughly test out the practicability of the proposed production methods.

Procedure To Qualify

To qualify for such an order, a company must be of sufficient size so as to be a major contributor in a war emergency without substantial expansion of its plant facilities. It should have financial and managerial stability of a calibre to warrant the conclusion that it would remain an asset after completion of the educational order. While it should be a manufacturing establishment, as distinguished from an assembly plant, it might properly obtain parts from its usual supplier.

Manufacturers to qualify should get in touch with the nearest district office of the branch of the service concerned. In order to obtain proper consideration, not only for the educational but for the current production program, each manufacturer should submit to the district office charged with responsibility for procurement in his particular line:

1. A complete description of his plant.
2. A complete list of products normally manufactured.
3. A list of items produced during the last war, which the manufacturer thinks could be produced in his plant in an emergency.

Manufacturers who believe the government is already familiar with their plant and facilities should check with the proper district procurement office to be certain.

Complete current information as to items required, including full specifications and detailed drawings, will be available through the following district offices:

Zone Quartermaster Corps Offices

Boston, Army Base; Brooklyn, N. Y., First avenue and 58th street; Philadelphia, 21st and Johnson streets; Atlanta, Ga., 500-502 Ten Forsyth building; Jef-

ferson, Ind., Tenth and Megis avenue; Chicago, 1819 West Pershing drive; St. Louis, Second and Arsenal streets; San Antonio, Tex., Normoyle Quartermaster depot; Detroit, 611 Federal building; San Francisco (no address given.)

Ordnance District Offices

Birmingham, Ala., 250 Federal building; Boston, room 2004 postoffice and customs house building; Springfield, Mass., Springfield armory; Chicago, postoffice department; Cleveland, 1524 Keck building; Detroit, 611 Federal building; Philadelphia, room 106 customs house, Second and Chestnut street; Pittsburgh, 1044 new federal building; Rochester, N. Y., 1118 Mercantile building; St. Louis, room 952 customs house and court house; San Francisco, room 1118 federal office building.

Air Corps

Buffalo, 65 Franklin street; Chicago, 1115 postoffice building; Detroit, 611 federal building; Los Angeles, Eighth and Figuora streets; Dayton, O., Wright Field; New York, 80 Broad street.

Corps of Engineers

New York, 39 Whitehall street; Philadelphia, 900 customs house, Second and Chestnut street; Pittsburgh, 925 new federal building; Chicago, postoffice building; Mobile, Ala., 304 Stables Power building; San Francisco, 401 custom house.

Medical Department

Brooklyn, N. Y., First avenue and 58th street; Chicago, 1819 West Pershing drive; St. Louis, Second and Arsenal streets; San Francisco.

Signal Corps

Brooklyn, N. Y., First avenue and 58th street; Chicago, 1819 West Pershing drive; San Francisco, Presidio.

Chemical Warfare

Boston, 200 postoffice and customs house building; New York, room 300, 45 Broadway; Pittsburgh, 1014-1016 new federal building; Chicago, 1113 postoffice building; San Francisco, room 117, federal building.

SWOC Local Repudiates Pact, Continues Strike

■ Strike at Allegheny Ludlum Steel Corp.'s Brackenridge, Pa., plant continued last week after the Steel Workers Organizing committee local had repudiated an agreement between company officials and a SWOC regional director to submit the dispute to an umpire.

Strike was called Sept. 7 in protest against alleged wage reductions. Two days later Clinton S. Golden, SWOC regional director, signed an agreement with W. F. Detwiler, company chairman, and W. A. Givens, company vice president, to submit the case to an umpire. Early last week SWOC local at Brackenridge voted to continue the strike.

Berger Awarded Cabinets For 12,247 Kitchens

■ Largest order for steel kitchen cabinets ever placed in the United States was awarded last week to Berger manufacturing division of Republic Steel Corp., according to L. S. Hamaker, general manager.

It calls for cabinets for 12,247 kitchens in the Parkchester housing development being constructed by Starrett Bros. & Eken for the Metropolitan Life Insurance Co. in the Bronx, New York. About 4000 tons of sheet steel will be used.

District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended Sept. 16	Change	Same week 1938	Same week 1937
Pittsburgh	70	+15	36	84
Chicago	67	+16	41.5	83
Eastern Pa.	57	+11	33	63
Youngstown	75	+18	46	70
Wheeling	86	+ 6	56	89
Cleveland	83	+15	48.5	63
Buffalo	67	+6.5	49	70
Birmingham	80	+10	57	91
New England	75	+ 5	60	75
Cincinnati	68	+11	65	80
St. Louis	62	None	42	74
Detroit	99	None	67	95
Average	74	+12	46	80

Cold Strip Production Records at Middletown

■ New production record was reported established last week when the cold reduction mill of American Rolling Mill Co.'s Middletown, O., plant rolled 809 tons of strip during an 8-hour turn. Material did not exceed 56 inches in width.

Mill also set a new 24-hour record by rolling 2131 tons. It is estimated enough strip was turned out in this period to lay a steel sidewalk about 4½ feet wide between Philadelphia and New York.

Company officials attribute the production feats to efficiency of mill crews and recent improvements in the plant's hot strip department which make possible more continuous operation of the cold mill.

Steel Corp. Shipments Rise 18.8% in August

■ August shipments of finished steel by the United States Steel Corp. totaled 803,822 tons, an increase of 127,513 tons, 18.8 per cent over July and 245,188 tons, 43.8 per cent over August, 1938. Shipments for eight months this year aggregated 5,873,397 tons, compared with 4,010,558 tons in the same period last year, an increase of 1,862,839 tons, 46.4 per cent.

U. S. STEEL CORP. SHIPMENTS

(Inter-company shipments not included)

(Tons)

	1939	1938	1937	1936
Jan.	789,305	518,322	1,149,918	721,414
Feb.	677,994	474,723	1,133,724	676,315
March	767,910	572,199	1,414,399	783,552
April	701,459	501,972	1,343,644	979,907
May	723,165	465,081	1,304,039	984,097
June	733,433	478,057	1,268,550	886,065
July	676,309	441,570	1,186,752	950,851
Aug.	803,822	558,634	1,107,858	823,703
Sept.		577,666	1,047,962	961,803
Oct.		663,287	792,310	1,007,417
Nov.		679,653	587,241	882,643
Dec.		694,204	489,070	1,067,365
Adj.*		‡30,381	†77,113	†40,859
Total		6,655,749	12,748,354	10,784,273

*Yearly adjustment. †Deduction. ‡Increase.

PRODUCTION

■ STEELWORKS operations last week advanced 12 points to 74 per cent, highest since the first week of October, 1937. Ten districts showed increased production and two remained stationary. A year ago the rate was 46 per cent; two years ago 80 per cent.

Youngstown, O.—Further activity carried the rate forward 18 points to 75 per cent, with schedules for this week indicating 78 per cent. Four blast furnaces are to be lighted shortly.

Central eastern seaboard—Gained 11 points to 57 per cent. One plant is at practical capacity and several open hearths have been added by another.

Chicago—Advanced 16 points to 67 per cent, highest since the final week of September, 1937. Further gain is indicated for this week.

St. Louis — Unchanged at 62 per cent, with one interest scheduling another open hearth this week.

Birmingham, Ala.—Up 10 points to 80 per cent, one open hearth being added, to make a total of 18 for the district.

New England—Gained 5 points to 75 per cent. More open hearths are scheduled for this week.

Pittsburgh—With many plants at capacity the rate rose 15 points to 70 per cent.

Wheeling — Increased 6 points to 86 per cent. Further gain forecast.

Buffalo—Reached 67 per cent, 6.5 points above the preceding week, and highest in two years.

Cincinnati—Increased 11 points to 68 per cent. Rolling schedules are moving up steadily.

Cleveland—Up 15 points to 83 per cent, close to the year's peak. Sustained output is indicated.

Detroit—Steady at 99 per cent, open hearths being pushed to capacity.

August Machine Tool Orders at High Level

■ Machine tool sales in August continued at a high level. Index of the National Machine Tool Builders' association, Cleveland, was 206.5, the fourth consecutive month it has been above 200. Considerable slackening of foreign orders contributed to the 10 per cent drop in new business from the July level. Domestic orders were practically equal to those for July.

Association's August index, of course, does not reflect the sharp increase in business which followed the outbreak of war at the beginning of this month. September index is expected to show a tremendous gain.

MEETINGS

WEIR TO SPEAK AT STEEL CONSTRUCTORS' CONVENTION

■ SEVENTEENTH annual convention of the American Institute of Steel Construction is announced for Oct. 17-18 at the Waldorf-Astoria hotel, New York. Representatives from all important shops in the United States fabricating and erecting structural steel shapes are expected to attend.

E. T. Weir, chairman, National Steel Corp., Pittsburgh, will address the banquet on Oct. 17. Two luncheon meetings are scheduled, one on Oct. 17 with A. D. Whiteside, president, Dun & Bradstreet, New York, as the speaker, and a second on Oct. 18 with Paul G. Hoffman, president, Studebaker Corp., South Bend, Ind., the speaker.

TOOL ENGINEERS GO AHEAD WITH CLEVELAND MEETING

American Society of Tool Engineers will conduct its semiannual meeting in Cleveland regardless of cancellation of the Machine Tool show. The date, however, has been moved back from Oct. 5-6 to Oct. 6-7. Headquarters will be at the Statler hotel. The program is being rearranged to include plant visits on Oct. 6, with the dinner and meeting in the evening. Various sessions are planned for Oct. 7. It is expected that the speakers originally engaged will appear on the program.

PORCELAIN ENAMEL ANNUAL MEETING IN NEW YORK

Porcelain Enamel institute will conduct its annual meeting at Hotel Pennsylvania, New York, Nov. 16-17. At this time, the 1940 program will be formulated and approved. Charles S. Pearce, 612 North Michigan avenue, Chicago, is managing director.

ENGINE WEAR TOPIC FOR S.A.E. TRACTOR MEETING

Reduction of engine wear will be the principal aim of papers to be presented at the national tractor meeting of the Society of Automotive Engineers at Hotel Schroeder, Milwaukee, Sept. 28-29. Surface finish as an influence in wear is one of the subjects which will command attention. D. A. Wallace, president, Chrysler Sales division, Chrysler Corp., Detroit, will present an address and demonstration on "Superfinish" at the dinner on Sept. 28.

PURCHASING AGENTS PLAN EXHIBIT IN SYRACUSE

Purchasing Agents' Association of Syracuse and Central New York will hold its fifth annual industrial products exhibit at Hotel Onandaga, Syracuse, N. Y., Sept. 27-29. The exhibit will open with a preview dinner Sept. 27 to which purchasing agents, associates, and exhibitors have been invited. Displays will include machines in operation and modern tooling. M. E. Jennings, Selflock Screw Products, is chairman of the committee directing the exhibit.

PLUMBING SUPPLY GROUP HOLDING CHICAGO MEETING

Central Supply association will hold its annual convention at the Palmer House, Chicago, Oct. 5-6. The organization is composed of wholesalers of plumbing products and heating products and distributors of pipe, fittings and valves, located west of the Alleghenies and east of the Rockies. W. E. McCollum, 228 North LaSalle street, Chicago, is secretary.

Foremen's Group Looks at Future

■ "THE FOREMAN OF TOMORROW" was the theme of the sixteenth annual convention and second annual exposition, National Association of Foremen, in Pittsburgh, Sept. 14-17, attended by 2000.

Return of workmen to the idea that their leader is the boss and not the labor organizer was sighted by Styles Bridges, Republican senator from New Hampshire, in the principal address Saturday. Senator Bridges pointed out that workers are beginning to realize continual strife has benefited only the labor leaders.

Speakers before other sessions included Hartley Barclay, editor, "Mill & Factory," on "Supervision in a Democracy," and Sherman Rogers, author and editor, on "The Foreman of Tomorrow."

Other interesting features included a demonstration of methods employed at Westinghouse Electric & Mfg. Co.'s East Pittsburgh plant, by a group of Westinghouse supervisors; a "challenge" to the foremen by Archie W. Graham, the Elliott Co., Jeanette, Pa., selected as "The American Workman," and an answer to this challenge by G. H. McClain, Republic Steel Corp., Cleveland. Group conferences were held on problems of the foreman and foreman training.

A. C. Horrocks, Goodyear Tire & Rubber Co., Akron, O., was elected president of the association; C. S. Coler, Westinghouse, executive vice president; Edward Seving, Sidney Grain Machinery Co., Sidney, O., was re-elected treasurer, and H. G. Evans, Goodyear, re-elected secretary.

Activities of Steel Users, Makers

■ MOLINE TOOL CO., Moline, Ill., has taken over manufacture and sale of the special high-production drilling, boring and tapping machines formerly manufactured by the Rockford Drilling Machine division, Borg-Warner Corp., Rockford, Ill. Moline will build these machines at its Moline plant with its present Hole Hog line of drilling, boring and honing machines.

•

Summerill Tubing Co., Bridgeport, Pa., has completed new laboratories, designed to aid manufacturers in improving their products, simplifying manufacture or assembly of parts, determination of seamless tubing type most suitable for specific purposes.

•

Wyott Mfg. Corp., Cheyenne, Wyo., Lewis C. Thomas, president, announces erection of metal foundry, the only one in Wyoming, to be in operation within 60 days. Manufacturer of liquid and fruit juice dispensers, the company plans production of parts used. Iron, brass, aluminum castings will be made.

•

Continental Can Co., New York, has begun preliminary operations at its new Oil City, Pa., plant. Regular production of lithographed cans for the oil industry is scheduled for the near future.

•

Cutler-Hammer Inc., Milwaukee, electrical manufacturer, announces its Denver office has expanded facilities and stocks to cover its complete lines. H. L. Vaughn, 1526 Blake street, Denver, is representative.

•

English Steel Corp. Ltd., Vickers Works, Sheffield, England, announces appointment of A. Milne & Co., 745 Washington street, New York, as United States correspondents.

•

Welding Equipment & Supply Co., Detroit, has appointed as representatives: Williams & Co., 901 Pennsylvania avenue, Pittsburgh, with branches at Cleveland, Cincinnati, Columbus, O.; L. A. Davis Welding Supplies, 194 Carey street, Wilkes-Barre, Pa., branches in Utica, N. Y., Philadelphia, Buffalo; Southern Oxygen Co., Arlington, Va.; New York Welding Supply Co., 75 Grand street, New York; Austin-Hastings Co., 226 Binney street, Cambridge, Mass.

What's New at Pittsburgh . . .

By R. L. HARTFORD
Pittsburgh Editor, STEEL

■ EXPANSION is today's keynote in this district. Order books are growing fatter, and there is considerable acceleration of production, with an accompanying rise in payrolls.

It is questionable whether steelmaking facilities here are in best shape to enter a period which will obviously tax productive capacities. Even before the avalanche of warborne orders following Labor day the first pinch was felt in bar mills. Currently little bar mill capacity is available, with some mills scheduled so heavily they probably will not see daylight at all during the fourth quarter. If current demand continues, bar shortages will be a most serious problem for manufacturers.

Operations here reached 95 per cent of capacity during 1937, and it is entirely possible this figure will again be attained in coming weeks. A gain of 12 points during the Labor day week, followed by another 5-point rise last week, with higher operations forecast for this week, indicate steelmakers are pushing ahead to capacity as rapidly as idle equipment can be conditioned. One favorable factor is that 1937 demand brought to light some unsuspected bottlenecks, many of which have since been eliminated. These concerned soaking pits, slabbing facilities, strip and sheet capacity. However, other difficulties still exist and are being given serious thought in steel headquarters.

* * *

To Produce Alloy Steel

Alloy electric steel up to 100,000 tons annually will be made in a new $2,000,000 plant soon to be built by Copperweld Steel Co., Glassport, Pa. Inquiries are out and a considerable part of the materials has already been placed. Plant is expected to be ready for production in the opening months of 1940. Its main building will cover 200,000 square feet, requiring 900 tons of structural steel.

Hitherto nonintegrated, the Glassport concern produces a copper-clad steel under patents, buying its steel in semifinished form and processing. Products are all wire items. In the new plant alloy steel will be produced and rolled, the rolling equipment consisting of a 29-inch blooming mill and four bar mills, 24-inch, 18-inch, 12-inch and 10-inch. Any surplus of steel over the company's requirements will be available for the merchant market.

According to S. E. Bramer, president and general manager, the mill site is not yet definite although it is expected to be at Glassport.

Demonstrates Mold Forming Process

■ United States Rubber Co. demonstrated its Ekko process for producing molds and dies by electroforming iron against patterns to be reproduced, at a luncheon meeting of approximately 75 business paper editors in New York, Sept. 12. Similar demonstrations were held in Cleveland, Sept. 13, and in Chicago, Sept. 14.

The process developed from researches by the company on more economical tire molds. In preparation of the molds, the original tread design and cavity are cut out of a steel forging with special engraving machines in the usual way. The steel forging then is mounted in a cast iron back called a watch case. These molds weigh about 600 pounds and require at least 165 manhours labor to produce.

A rubber pattern then is made over an iron shell from the first master mold. The pattern, of course, has the appearance of the finished tire. The rubber pattern is rendered conductive by dusting it with powdered graphite.

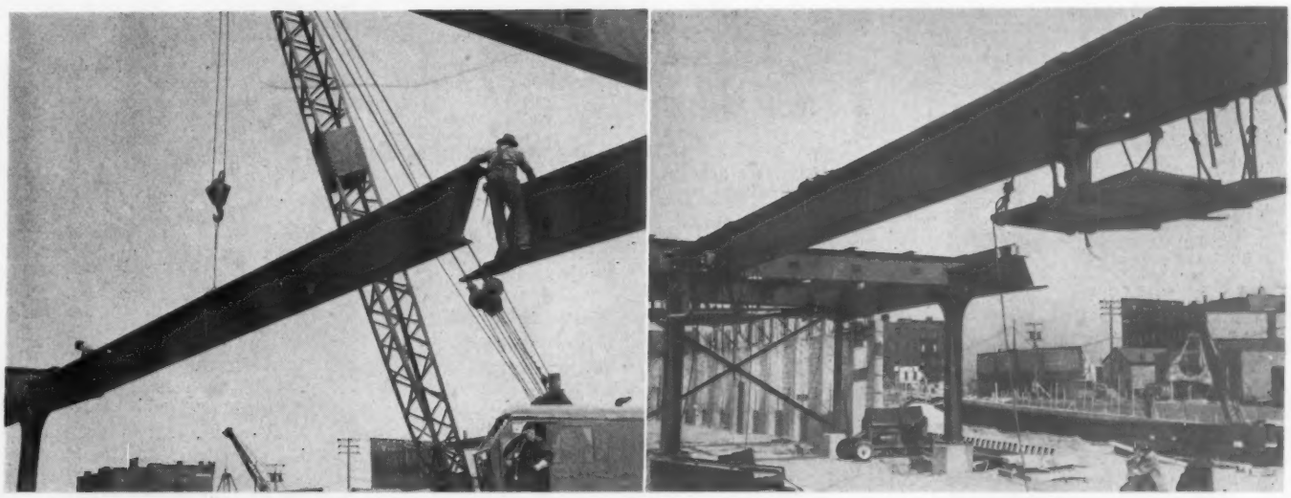
Iron Deposited 99.98% Pure

Ingot iron anodes are used in the electrolytic bath and the pattern, of course, is the cathode. Iron deposited on the pattern is approximately ½-inch thick, 99.98 per cent pure, and substantially free from porosity. It is about 50 per cent harder than cold rolled steel and gives a scleroscope reading of 37, or 240 Brinell. It can be annealed to give the normal values for pure iron or hardened by carburizing. Conductivity is reported twice that of cast iron or steel.

The process is offered for many types of molds. While the United States Rubber Co. usually uses rubber patterns, practically any material may be used with the exception of zinc and aluminum, provided the surface is made conductive. The process maintains both the contours and finish of the pattern.

Where a noncorrosive surface is required, the pattern may be first plated with nickel and subsequently completed by adding a thick coating of iron. For stamping out sheet metal objects, both the die and the force may be electroformed.

Miles of Welded Seams Unite Girders in New Cleveland Bridge



■ Erecting girder frames, left, and welding girder web joints, right, part of more than 70 miles of arc-welding seams on Main street bridge, Cleveland. Photo courtesy Lincoln Electric Co., Cleveland

MEN OF INDUSTRY

■ AVERY C. ADAMS has been elected vice president in charge of sales and to the executive committee and board of directors, United States Steel Corp. of Delaware, Pittsburgh. Mr. Adams, following university training in metallurgy at Yale, has spent his entire business career in the steel industry.

A native of Youngstown, O., he received several years' experience in steel mills in that district, specializing in metallurgy before entering sales work. He first joined United States Steel subsidiaries in 1936 as sheet division sales manager, Carnegie-Illinois Steel Corp., Pittsburgh, after having served as sales executive with Trumbull Steel Co., Warren, O., Republic Steel Corp., Cleveland, and General Fireproofing Co., Youngstown. Since Dec. 1, 1938, he has been vice president and general sales manager, Inland Steel Co., Chicago.

Mr. Adams succeeds C. V. McKaig, who becomes assistant to president, continues as member of the executive committee and board of directors.

♦

L. Hansen, consulting electrical engineer, Harnischfeger Corp., Milwaukee, opened American Welding Society's fall lecture course, in Peoria, Ill., Sept. 6, with "Outline of Welding Processes" his subject.

♦

G. G. Hein, president, Hein-Werner Motor Parts Co., Waukesha, Wis., was recently presented a gold watch by employes, commemorating ten years of business for the company.

♦

Stephen W. Terry has been appointed general sales manager, Monarch Steel Co., Indianapolis, with headquarters at the main plant, in that city. For the past 23 years Mr. Terry was associated with La-Salle Steel Co., Chicago.

Stephen W. Terry

♦

Harold G. Jones has been appointed western Pennsylvania, West Virginia, eastern Ohio agent for Thomas Laughlin Co., Portland, Me.

♦

W. Roy Moore has been added to the sales force of Clemson Bros. Inc., Middletown, N. Y. He will handle New England territory, with headquarters at 31 Hillside avenue, Plantsville, Conn.

♦

H. R. Lasch, manager, Machine Tools Ltd., P. O. Box 5458, 206 Commissioner street, Johannesburg, Union of South Africa, is now in this country making agency arrangements and purchasing machinery.

Avery C. Adams

♦

Otto C. Hartig has resigned as plant manager, Atlas Drop Forge Co., Lansing, Mich., but will continue as secretary-treasurer and a director. He has been with the company 25 years.

♦

Adolph J. Ackerman has been appointed engineering director, Dravo Corp., Pittsburgh. A Wisconsin university graduate, Mr. Ackerman was formerly Dravo's engineering works and contracting division development engineer.

C. B. Jansen was appointed manager, B. E. Rhoads, chief engineer, general construction department.

♦

Philip G. Johnson has been elected president, Boeing Airplane Co., Boeing Aircraft Co., Seattle, and C. L. Egtvedt chairman of both companies. Mr. Johnson will devote his attention to manufacturing executive work, Mr. Egtvedt to technical development, sales promotion. Both attended Washington university, joined Boeing Co. in 1917, as engineering department draftsmen.

♦

Russell G. Creviston has been selected trade relations director for Crane Co., 836 South Michigan avenue, Chicago, valves, fittings, tools, sanitary fixtures, heating equipment manufacturer. He has been advertising, sales promotion director for ten years; is a member, public relations committee, National Association of Manufacturers, and construction and community development committee, United States chamber of commerce.

H. H. Simmons was promoted to sales promotion, advertising manager, succeeding Mr. Creviston.

♦

Boyd W. Bullock has been appointed advertising manager, appliance and merchandise department, Bridgeport, Conn., division of General Electric Co., Schenectady, N. Y. Mr. Bullock has been associated with General Electric's publicity department at Schenectady for 17 years, has been assistant manager of publicity since 1933.

♦

R. Carson Dalzell has been appointed technical advisor to Revere Copper & Brass Inc., Baltimore division. After extensive metallurgical experience, he was employed by American Oil Co., Baltimore, from 1933 to 1937, resigning to go with Revere on Sept. 15, 1937.

♦

Walter S. Finlay Jr. is joining the J. G. White Engineering Corp., New York, as vice president. Mr. Finlay was for many years vice president, American Water Works & Electric Co., New York, later was president of its West Penn Electric Co., Pittsburgh.

♦

John P. Hoelzel has been elected president, Pittsburgh Screw & Bolt Mfg. Co., Pittsburgh. Mr. Hoelzel

John P. Hoelzel

was formerly vice president and general sales manager of the company, a subsidiary of Pittsburgh Screw & Bolt Corp., Pittsburgh.

♦

A. W. Wennerstrom has been selected manufacturing head, air conditioning and commercial refrigeration department, Bloomfield, N. J., plant, General Electric Co., Schenectady, N. Y. H. D. Kelsey will be in charge of engineering in the Bloomfield plant. Appointments effective as of Sept. 1.

♦

Dr. Francis M. Walters has been appointed to the naval research department, Washington, to begin work of an undisclosed nature in metallurgical research. Formerly with Youngstown Sheet & Tube Co., Youngstown, O., Dr. Walters started his new duties Sept. 18.

♦

John Lyon Collyer has been elected president, B. F. Goodrich Co., Akron, O., succeeding S. B. Robertson, resigned. Graduating from Cornell university, Mr. Collyer joined the mechanical engineering staff, Bethlehem Shipbuilding Co., Bethlehem, Pa., later entered the rubber industry with Dunlop Tire & Rubber Co.,

John L. Collyer

Buffalo, with which company he has since been associated.

♦

George B. Comfort has been made sales promotion manager of Schramm Inc., welding, pneumatic equipment manufacturers, West Chester, Pa. He first served the company as factory manager, more recently as engineering sales manager. Joseph E. McGrogan was selected manager, Schramm department, Equipment Rental Co.

♦

Gordon T. Williams, for the past nine years metallurgist, Cleveland Tractor Co., Cleveland, has resigned to accept the position of metallurgist, testing and research laboratories, Deere & Co., Moline, Ill., effective Oct. 1. He will be engaged with heat treating and other metallurgical problems. Mr. Williams is a member of the American Foundrymen's association, American Society for Testing Materials, American Welding society, and American Society for Metals, having served as chairman of the Cleveland chapter of the latter in 1937.

Warren A. Silliman has been

Gordon T. Williams

made metallurgist, Cleveland Tractor Co., Cleveland. A graduate of Fenn college, Cleveland, he has served in the capacity of assistant metallurgist for the last six years.

♦

H. W. Christensen has been appointed purchasing agent for Columbia Steel Co., San Francisco, succeeding L. S. Jones, retired. Born in Brooklyn, N. Y., Mr. Christensen left college to enter military service, later was employed by Consolidated Steel Corp. Ltd., Los Angeles, as purchasing agent. Joining Columbia Steel as rolled steel products department sales manager in 1933, he was appointed assistant district sales manager in charge of service in 1938.

♦

Willard F. Place, vice president, New York Central railroad, has been appointed vice president in charge of finance for the system.

♦

Arthur C. Evans has been appointed to the engineering staff, road machinery division, Gar Wood Industries Inc., Detroit.

DIED:

■ DR. C. L. NORTON, 69, director, division of industrial co-operation, Massachusetts Institute of Technology since 1921, nationally known inventor and engineer, at his home in Annisquam, Mass., Sept. 8. Among Dr. Norton's contributions to industry is a machine for making silica brick.

Fellow of the American Academy of Arts and Sciences, American Physical society, American Association for Advancement of Science, American Society of Mechanical Engineers, American Ceramic society, Society for the Promotion of Engineering Education, he was active also in National Fire Prevention association, American Society of Testing Materials.

♦

Dresser T. Bates, 94, co-organizer, Athol Machine Co., Athol, Mass., in East Orange, Mass. He was plant superintendent of Athol company until his retirement, 15 years ago.

♦

Charles D. Rice, 80, vice president, Underwood-Elliott-Fisher Corp., New York, in Hartford, Conn., Sept. 10. He was identified with the typewriter industry for 35 years.

♦

Josiah Manning Lasell, 75, president, Whitin Machine Works, textile machinery manufacturers, Whitinsville, Mass., at his home in that city. President of the Whitinsville National bank, Mr. Lasell was a Williams college graduate, member fourth generation of the family which founded the machine works.

♦

Max Luria, 67, president, Luria Steel & Trading Co., New York, treasurer, Luria Bros & Co., Philadelphia, at his home in Atlantic City, N. J., Sept. 9. Mr. Luria was one of the founders of Luria Bros. & Co.

♦

Thomas H. Ritner, 42, chief engineer, W. P. McDonald Construction Co., Flushing, L. I., in East Orange, N. J., Sept. 10.

♦

Albert J. Davis, 72, retired inventor, manufacturer of dairy machinery, in Milwaukee, Sept. 11. He had formerly headed the Davis Co., Chicago.

♦

Israel M. Mintz, 93, for nearly 50 years head of I. M. Mintz & Son, scrap iron and metal firm, Oil City, Pa., at his home in Oil City.

♦

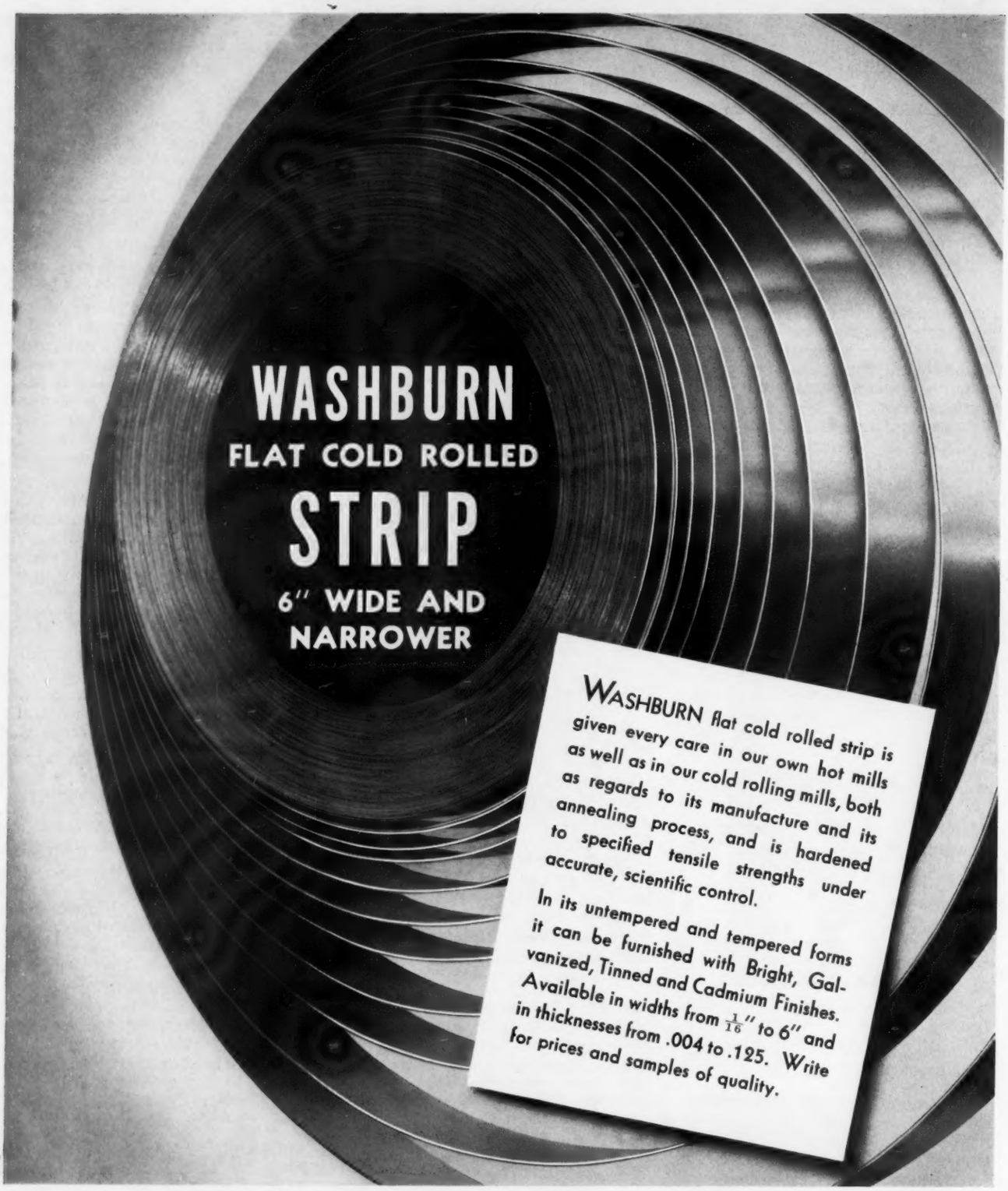
Ivan M. Bregowsky, 75, chemical and metallurgical engineer, in Hollywood, Calif., Sept. 10. He had been general manager of Grabler Mfg. Co., Cleveland, pipe fittings and accessories manufacturer, until four months ago. During the World war he served as metallurgist, army ordnance department, Chicago.

♦

E. M. Tiller, president and general manager, Iowa Foundry Co., Sioux City, Iowa, at his home in that city.

♦

Israel Bialosky, 78, former partner in Cleveland Iron & Metal Co., in Cleveland, Sept. 11.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Windows of WASHINGTON

By L. M. LAMM
Washington Editor, STEEL

WASHINGTON

■ TALK in Washington last week centered almost entirely around the special session of congress which was called by President Roosevelt for Sept. 21.

There is no question in the minds of Washington newsmen but that the President would much rather not have called the special session, but apparently there was no way around it. It has been stated in well-informed circles that he tried to "sew up" leaders of both the majority and minority to take up nothing but neutrality in the session and then adjourn until the regular session in January. However, it is a foregone conclusion members are not going to be bound by any such agreement.

Congress has no way of getting itself into session except on Jan. 3, as provided by law, but when they are called into session, special or otherwise, they can take up anything they desire and no one can adjourn congress except the two houses themselves, or the time limitation at midnight Jan. 2, when they would again come into session Jan. 3.

In addition to the fact that the President knows there will be a long discussion of the neutrality question, there are other matters on the calendar of both houses which can be considered if congress desires.

There is certain to be much talk about iron and steel and scrap, particularly the latter, as there are a number of bills for restricting scrap exports. Congressional members probably are not aware of the fact that scrap is bought by foreign countries f.a.s., paid for 90 per cent against documents, with the remaining 10 per cent on receipt and verification of weights and qualities. Also in a great majority of cases foreign buyers provide the ships; therefore scrap has been all along on a cash and carry basis.

At one of his press conferences last week, the President told the newsmen the administration is watching rising commodity prices, and he particularly spoke of copper. He was questioned by one of the correspondents regarding steel prices, and he said "of course, these are being watched," but he indicated he had not heard of any particular rise in steel costs.

The President announced at his press conference Friday that he will have his neutrality message ready for congress when it convenes. He stated he does not expect to ask for any antiprofiteering legislation, nor will he ask for a deficiency appropriation because of the present emergency.

He has requested the latest unemployment figures from government sources.

ARGENTINA RELAXES CURBS ON STEEL IMPORTS FROM U. S.

Exchange restrictions applying to imports from the United States into Argentina have been greatly relaxed, according to the department of commerce.

Among products now permitted to be imported in unlimited quantities are iron and steel pipe, steel wire and cable (except barbwire), nails, nuts, screws, and high carbon steel bars and plates.

Cablegram to the commerce department from American legation at Stockholm, Sweden, states that exportation from Sweden of iron ore and iron and steel, along with other staple products, has been made subject to permit.

SCRAP FORMULATING EMERGENCY PLANS

Edwin C. Barringer, executive secretary of the Institute of Scrap Iron and Steel Inc., New York, conferred here last week with planning division officials of the war and navy departments.

Institute's board of directors recently pledged support to the new war resources board.

Mr. Barringer asserted the institute is prepared to represent the iron and steel scrap industry in the event of an emergency through its special war service committee which has been functioning for a number of months.

BRITISH STEEL UNDER GOVERNMENT CONTROL

Iron and steel may, with certain exceptions, now be purchased in the British isles only under license from the ministry of supply into whose control the industry passed Sept. 1, according to a cablegram received from the American embassy at London. (STEEL, Sept. 11, p. 85)

Steel under contracts closed prior to Sept. 1 and purchases in quantities not exceeding ½-ton are exempted from licensing, but even so may be subjected to the operation of certain "priorities."

Government departments, purchasers needing supplies for civil defense purposes, and certain shipbuilding, railway and coal mining enterprises are included in the main classes of first priority users.

Determination of relative degrees of priority particularly between orders placed by various government departments is, according to the British press, occasioning more difficulty than is the allotment of available supplies between private and government contracts. The iron and steel industry, however, is cooperating with the government in evolving a definite system of or basis for these priorities with this facilitated by the fact that the industry even before the outbreak of war set up its own system of voluntary priorities to which the majority of producers adhered.

Maximum prices are reported also to have been established for the principal iron and steel products. Prices already scheduled are those

which were current in the industry at the outbreak of war and, according to the best information available, will remain unchanged until Oct. 31.

At present no licenses are required for domestic dealing in scrap iron and steel, but they must be secured from the export licensing department of the Board of Trade prior to the exportation of scrap or certain iron and steel products.

RULES FIXED FOR TAXING WAGES OF EMPLOYES OVER 65

Guy T. Helvering, commissioner of internal revenue, announces issuance of regulations regarding the time when employers should report and pay over to internal revenue collectors the employers' and employes' taxes with respect to wages paid for services performed on and after Jan. 1, 1939, by employes who have attained 65 years of age.

Regulations are made necessary by a provision of the "social security act amendments of 1939" eliminating the exemption of employes over 65 and making taxes with respect to their wages retroactive to Jan. 1, 1939, unless they are engaged in agricultural labor, domestic service or other exempted occupations.

As a result of this amendment employers now are required to deduct from wages paid to employes over 65 for services performed after Aug. 10, 1939, the date of the amendment's enactment, not only the 1 per cent employes' tax, but also the tax at same rate on all taxable wages paid to such employes for services rendered from Jan. 1, 1939, through Aug. 9, 1939.

Employer is liable for all such taxes collected by him. He is liable even though he does not collect the tax, with one specific exception.

This exception, it is emphasized, applies only to the employer's liability for the workers' tax and does not extend to his liability for his own tax. The employer thus is liable for his share of the tax on all taxable wages paid to each employe over age 65 for services performed on and after Jan. 1, 1939, irrespective of the fact that such employe may since have resigned or been discharged.

HOUSE GROUP NAMES SPECIAL AIDES FOR NLRB PROBE

Special committee named by the house to investigate national labor relations board has appointed Edmund M. Toland its general counsel, and Roger Robb, assistant counsel, Charles A. Randall and Arthur Reilly as investigators.

Representative Smith, Virginia, committee's chairman, states his legal staff will prepare an analysis of cases handled by the labor board to give the committee an insight into NLRB policies. He explained this does not mean his committee will rehear cases decided by the board.

Other committee members are Representatives Healey, Massachusetts, Murdock of Utah, Halleck of Indiana, and Boutzohn of Ohio.

GERMANY STANDARDIZING MACHINE TOOLS

Standardization of machine tools manufactured for domestic use in Germany now is under consideration to relieve the enormous pressure on that country's machine tool industry, it is reported by the department of commerce.

Domestic demand alone has been taxing the industry's capacity. Plant extensions, modernization of equipment, organization measures and the like have already been pushed to the limit. Skilled labor is difficult to procure. At the present time delivery terms for non-preferential domestic orders are two years in the case of specially designed machines and one year for standard equipment.

Notwithstanding the domestic situation, efforts to expand Germany's machine tool exports, the bulk of which consists of metalworking machinery, have been intensified during the past year. Foreign shipments during the first half of 1939 rose to $42,000,000, as against $34,000,000 in the corresponding period of last year, an advance of some 23 per cent. Since the first of this year, however, foreign demand has been diminishing.

Japan ranked as the leading foreign market for German machine tools in the first six months, followed by Italy, Great Britain, Danzig and Poland, Rumania, Russia.

ITALY TO CONTROL METALS EXPORTS BY LICENSING

Italy has established license controls over exports of a large number of products for the declared purpose of protecting domestic supplies of essential materials. Included are iron, steel and other metals, airplanes, automobiles and ships.

Governments of the Straits Settlements and Federated Malay States have established licensing systems embracing practically all exports, according to the American consul general at Singapore. Tin ore and concentrates are among exports subject to licensing.

GOVERNMENT IRON, STEEL AWARDS TOTAL $4,935,698

During the week ended Sept. 9 the government purchased $4,935,698.35 worth of iron and steel products under the Walsh-Healey act: Pittsburgh Screw & Bolt Corp., Pittsburgh, $16,658.34; A. Finkl & Sons Co., Chicago, $11,648; Carnegie-Illinois Steel Corp., Pittsburgh, $4,702,240; Surface Combustion Corp, Munhall, Pa., $26,784; Foster-Wheeler Corp., New York, $64,995; MacWhyte Co., Kenosha, Wis., $15,810.12 (estimated); Standard Pressed Steel Co., Jenkintown, Pa., $28,666.09; Powerlite Switchboard Co., Cleveland, $12,800; Tyson Roller Bearing Corp., Massillon, O., $10,296; and Air Cruisers Inc., Clifton, N. J., $34,950.

STAFF REORGANIZED BY PRESIDENTIAL ORDER

White House staff organization has been materially revised by last week's Presidential order dividing the executive offices into three sections. Not an emergency measure, this is a direct outgrowth of the reorganization bill passed at congress' last session.

Purpose is to speed up administrative action, bring under direct control the bureau of the budget, national resources planning board and new organization including a liaison office for personnel management.

EXPECT INCREASES IN STEEL EXPORTS

Government experts who deal with the steel industry feel certain the European conflict will help American steel exporters in various markets of the world.

They point out that up to a couple of years ago Germany was the largest steel exporting nation to non-producing markets. However, when the German rearmament program became intensive their exports were materially reduced, and now there will be no exports from Germany.

Belgium - Luxemburg, another large steel exporting country, it is believed by government experts will be practically cut out of the South American market because of the blockade and the inability to get cargo space. It is assumed also by officials of the government that is is reasonable to expect Belgium-Luxemburg steel will go to Germany, France and England.

The United Kingdom, which has been the largest exporter of steel and steel products, is entirely out of the running insofar as exports are concerned; France never has been a large steel exporter.

Inquiries are being received in Washington from South America and other countries requesting American agencies for steel mills. The largest South American importers of steel include Argentina, Brazil, Chile, Peru, Colombia, and Venezuela.

Japan also up to the time of its "incident" with China was a steel exporter, but more recently it has been buying steel mainly from Europe. It is expected these purchases will be diverted to the United States.

AVIATION

PLANE BUILDERS FORESEE "UNPRECEDENTED ACTIVITY"

■ AIRCRAFT builders believe a period of unprecedented activity lies ahead for their industry.

With unfilled orders aggregating a record $335,000,000, plane, engine and partsmakers are delivering at the rate of approximately $18,000,000 monthly. On this basis, experts assert, the industry still is operating far below its present productive capacity of some $470,000,000 a year. They estimate monthly output will reach $25,000,000 by the year's end, bringing the 1939 total to about $200,000,000, compared with $140,000,000 last year.

Probability is for backlogs to be swelled by additional large orders. Although authorized air corps buying is virtually completed for this fiscal year, substantial navy awards still are in prospect. Moreover, it is considered likely the administration will ask congress during its special or regular session to provide funds for air corps expansion 500 planes above that already scheduled.

Report "Diversion" Inquiries

Business diverted by neutrals from warring nations unable to supply their requirements may be substantial. Inquiries already are reported, particularly from South America. Turkey, Holland, Scandinavian countries appear promising customers.

Despite uncertainty as to neutrality act revision, French and British procurement agents show undiminished interest in American warplanes. It is said they are ready to place quantity orders should the arms embargo be lifted. Notwithstanding the ban on plane exports to belligerents, domestic plants are continuing production on their unfilled British, French and Australian contracts, believed to exceed $60,000,000. Clauses in the awards provide equipment may be delivered to domestic ports and stored for duration of the embargo. In some cases manufacturers have been paid in advance. Lockheed Aircraft Corp., Douglas Aircraft Co. and North American Aviation Inc. together are turning out planes for England and France at a rate of $7,500,000 monthly, while motor builders are producing each month for France alone some 400 high-speed engines.

Heavy Exports Cut Off

How large were shipments before being blocked by the embargo? During the first seven months this year exports of airplanes, engines and parts, principally to the now belligerent democracies, amounted to $58,049,775, nearly 35 per cent more than for the same period in 1938.

Recent awards by the war department: Curtiss Aeroplane division of Curtiss-Wright Corp., Buffalo, observation planes, $5,000,000; Fairchild Aircraft Corp., Hagerstown, Md., primary training craft, $1,579,338; and Ryan Aeronautical Co., San Diego, trainers, $193,590. Pratt & Whitney division of United Aircraft Corp., East Hartford, Conn., has signed a contract to build for the navy engines and parts costing $900,000.

Navy department awarded to Albert Kahn Inc., Detroit, the architectural engineering contract for constructing authorized air bases in United States and territories. Requiring $53,000,000 over the next three years, work will involve 400 buildings, including barracks, hangars and repair stations.

Bethlehem Steel Co., it has been announced, will fabricate and erect 465 tons of structural steel for a plant now under construction in Los Angeles for newly-organized Northrop Aircraft Inc.

Growing demand for aviation gasoline is bringing out programs for building new refining and storage facilities for this fuel. Magnolia Petroleum Co. will complete by close of the year a $1,000,000 aviation gasoline refining unit at Beaumont, Tex., with 1,000,000-barrel annual capacity. At Hartford, Conn., Colonial Beacon Oil Co. is constructing a 1,000,000-gallon storage tank for airplane fuel.

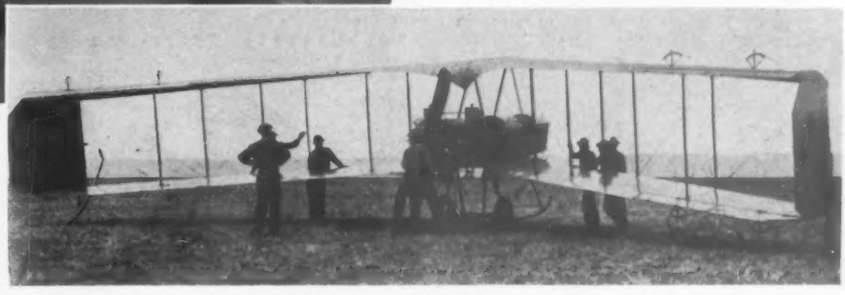
A new lightweight aircraft jack with high lift and mobility is announced by Farnham Mfg. Co., Buffalo. Operated either by air, electrically, or manually, unit has an all-welded steel frame with triangular base. Capacity ranges from 1 to 25 tons.

AIRCRAFT MEETING TO FOCUS ATTENTION ON PRODUCTION

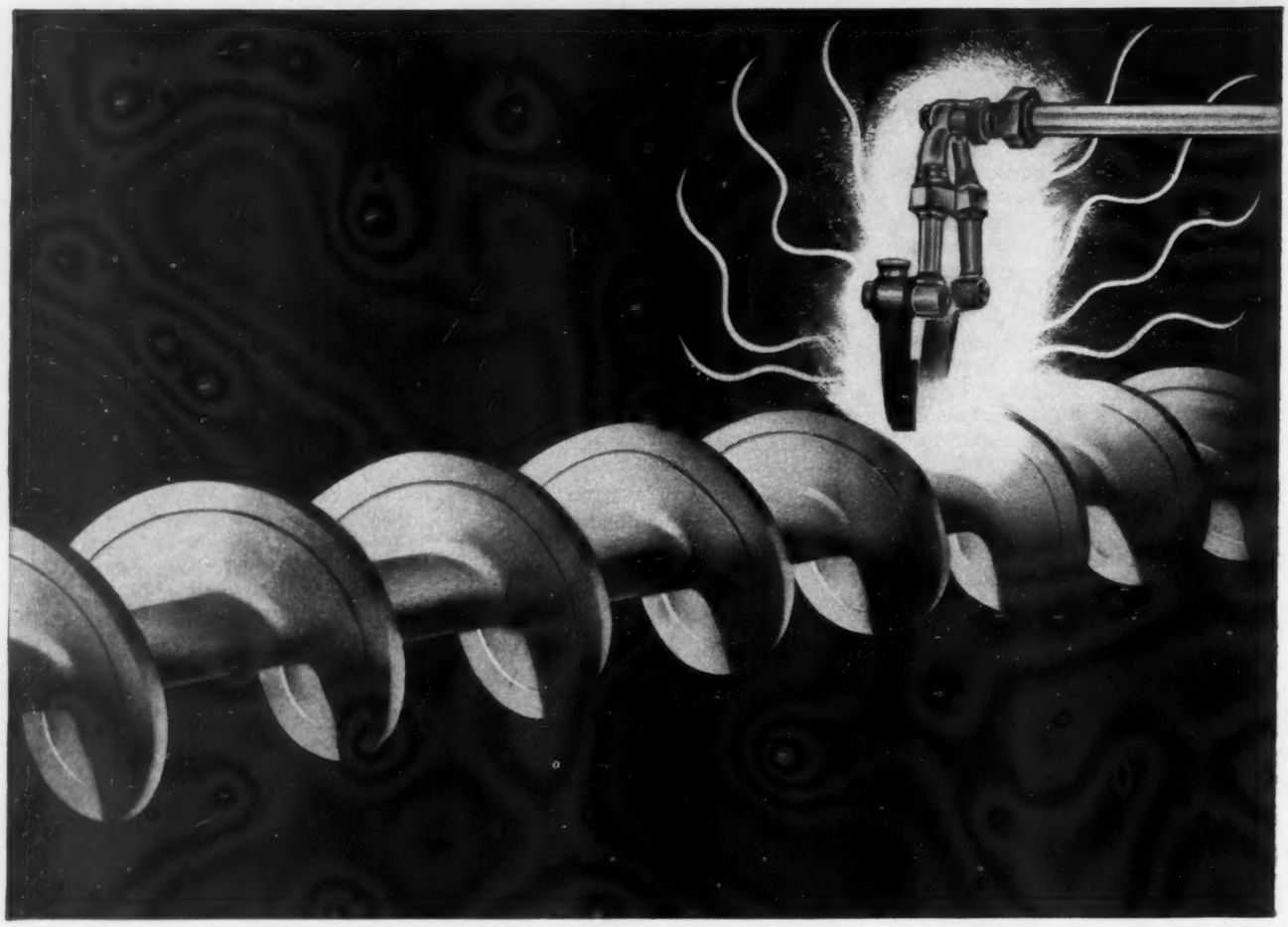
Louis B. Johnson, assistant secretary of war, Washington, will be a principal speaker at the fourth National Aircraft Production meeting of the Society of Automotive Engineers at the Biltmore hotel, Los Angeles, Oct. 5-7. Quantity production necessary to meet demands of accelerated governmental and commercial purchases, as well as those of private buyers, will get special attention in technical papers. Materials and interchangeability in manufacture are two subjects for discussion. The first aircraft engineering display will run concurrently with the three-day meeting.

August Gear Sales Up

■ Gear sales in August were 7 per cent above those for July and 26 per cent ahead of those for August, 1938, according to American Gear Manufacturers association, Wilkinsburg, Pa. First eight months this year show a gain of 21½ per cent over the same period in 1938.



■ **Metals have paced aviation's development of safer and more efficient planes for schooling embryo pilots. In 1916 army flyers trained in fabric craft like that at right. Today they are using ships such as these low-winged metal-fuselage Ryan trainers**



LENGTHENING THE LIFE OF EXPENDIBLE PARTS

The replacement of expendible parts has a persistent way of blocking the path to mine operating economy. By the same token, it offers a great opportunity for cost reductions.

For example: a mine was having plenty of trouble with conveyor screws for handling cinnabar. Requisitions for replacements were coming along all too frequently.

Chromium-Molybdenum cast steel screws solved that problem. A simple preliminary heat treatment gives the screws strength and toughness to withstand heavy pressure and impact loads. Flame hardening the flights to 630 BHN gives them the ability to stand up for long periods under the severely abrasive action of the ore.

The records show that the Chrome-Moly screws last three times as long as others previously used which were actually higher in cost.

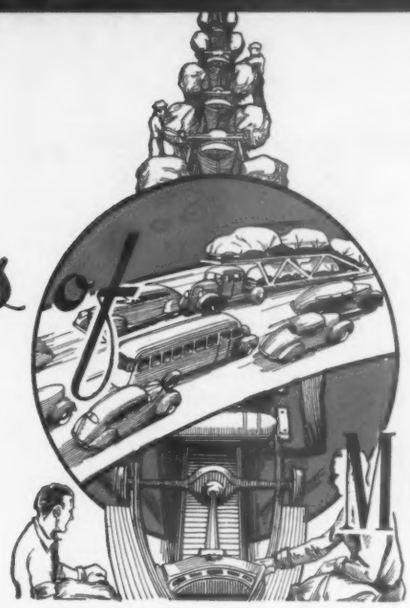
Rechecking your own parts specifications may disclose opportunities for similar savings. Our technical book, "Molybdenum in Steel", is sent free on request to interested production executives and engineers.

PRODUCERS OF MOLYBDENUM BRIQUETTES, FERRO-MOLYBDENUM, AND CALCIUM MOLYBDATE

Climax Mo-lyb-den-um Company
500 Fifth Avenue · New York City

MOLY

Mirrors of MOTORDOM



By A. H. ALLEN
Detroit Editor, STEEL

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DETROIT

■ INFLATIONARY reaction following declaration of war in Europe daily is assuming greater proportions and is viewed with mixed emotions by industrial executives in this district. On the one hand, suppliers of materials for automobile manufacture are so swamped with orders and demands for advance price information they are almost at a loss to know which way to turn. On the other hand, auto sales officials are pondering the effect which a sharp increase in living costs is going to have on car sales over the immediate months ahead.

Sharp increase in security prices the day after hostilities opened abroad is believed to have touched off the wave of buying sentiment encountered in the past two weeks. The public, noting a boiling stock market, practically stampeded sellers of everything from sugar to steel. Sales officials of steel companies who two weeks ago were wondering how they could ever clear up difficulties created by recent price concessions to large buyers worry about this no longer. In Washington, New Dealers saw possibilities of commodity surpluses being moved at profitable prices and exclaimed, "We planned it that way."

Business analysts here, not easily swayed by mass movements or enthusiasms, say there is no sound reason for the present bullishness. Prospect of enormous European purchases from American industry is good, but they have not matured as yet, and there is some question as to just what the word enormous may signify. It is estimated that on the basis of credit obtainable on present gold reserves, European countries might be able to purchase five billion dollars worth of goods in this country. That is a lot of buying, but not so much when it is stacked up against the billions which the federal government has dumped into trade channels in the past few years, without telling effect.

Of course there are scattered instances of European buying already, such as the reported transfer of a $10,000,000 machine tool order by Japan from Germany to this country. Steel export offices say they are flooded with inquiries for tonnages. A scale manufacturer last week reported receipt of an order for about 70 platform scales from Finland, the first business from this country in many years. The connection between platform scales in Finland and the war in Poland is remote, but no other explanation of this unexpected business could be established.

A steel producer here, operating all open-hearth furnaces in its plant, could use several more units on the strength of current business, according to a spokesman for the company last week. When questioned as to what would be done should a roof collapse on a furnace now in service, he replied they would operate the furnace without a roof!

Automotive-wise, a number of disturbing factors are seen. In the first place, a sustained increase in the cost of living would force many

■ **Restyled front ends, longer wheelbases, larger fenders and numerous mechanical improvements feature these three units in the 1940 Chrysler lines. From left to right are Plymouth, Dodge and De Soto**

people to defer purchases of new cars. Against this is the possibility of a pronounced improvement in foreign truck buying. Further, it is seen likely that increases in the cost of steel, wool, cotton, nonferrous metals and other materials may force a mark-up in retail prices of automobiles after the first of the year. Such an eventuality would infer a rush to buy new cars before the turn of the year which conceivably could push production in the next three months to 1929 levels, but at the expense of output after Jan. 1. However, in critical times like these, it is probably foolish to be concerned about events three months away.

In any event, the reaction of the public to new cars at automobile shows next month will be watched carefully as the tipoff on sales for the balance of the year.

■ DETAILS have been announced on four more of the 1940 models—Nash, Plymouth, Dodge and De Soto—making seven in all which have unveiled their new product, with about ten more still to come.

Nash is featuring a new type of front suspension with coil springs, larger rear shock absorbers, improved stabilized steering gear, manual gearshift on steering column on all models, Carter carburetors on all models, sealed-beam headlamps and slightly remodeled front end with an airplane wing motif. Insulation is now used at every point where the body is attached to the chassis. Further antinoise precautions include more extensive use of "sand mortex" compound on steel panels. In all, 18 models are available, six in each of three series of cars. Price reductions from $20 to $50 have been effected.

Plymouth models have 3-inch longer wheelbase, new bodies, improved riding qualities through relocation of seats with respect to axles, sealed-beam headlamps, a new steering post gearshift standard on both deluxe and Roadking models, safety signals on all instruments, redesigned transmission and clutch, 270 square inches of added ventilating surface for air intake to the radiator core, larger and more massive fenders both front and rear, 20 per cent greater windshield area, concealed front door hinges, and curved one-piece rear windows. In common with other Chrysler models, a stone shield is carried between the rear bumper and the body, arranged so that it will not damage the body when the bumper is struck. Brake drums and engine tappets are now superfinished for better wear. Front seats have 4 inches more hip room, 3½ inches more headroom.

All pistons in Chrysler models for 1940 are superfinished for smoothness and then "stannic coated" or tin plated to avoid initial scuffing. This supersedes the former anodizing process used on these aluminum pistons.

Changes made in bodies and chassis of all the Chrysler lines have been in the direction of obtaining a better ride by making use of the so-called "airflow" principle of the old Chrysler Airflow models, that of moving the rear seat well ahead of the rear axle. Actually what was done was to keep overall length and frame length the same, but to move the rear axle back about 7½ inches and the front axle back about 4 inches, accounting for the longer wheelbase. This permitted using rear doors with no cutouts or doglegs to clear the wheel housing. Propeller shafts are no longer than formerly, the difference of 3½ inches between motor and rear axle being taken up by an extension at the rear of the transmission case which can be removed and an overdrive inserted on those models offering overdrive. The latter will be offered as special equipment on the De Soto, Chrysler 8, and as standard on the Chrysler Crown Imperial which also carries the fluid drive as standard. By changing the transmission on all models so that controls enter from the side instead of from the top, it was possible to lower floor levels.

In addition to changes outlined above the new custom and deluxe De Soto models have 100-horsepower engines, more room inside, larger windows, restyled front ends and new appointments in interiors. Center of gravity is lower because of changes in frame design, among which is a stronger front cross member. Rear springs are mounted in rubber shackles, eliminating two lubricating points on each. Sealed-beam headlamps are used, of course, as on all other Chrysler lines. A new De Soto model this year is the convertible coupe with mechanically operated top. All models are available with or without running boards. De Soto incidentally, is going to be characterized (in advertising probably) as the "great American family car."

Dodge stresses the "floating" ride achieved by chassis changes previously outlined, although in the Dodge line the wheelbase is increased by only 2½ inches. The Dodge engine features a system by which the valve seats are spray-cooled from a steel tube extending through the cylinder block and connecting with the centrifugal water pump. Water is delivered through openings in this tube and sprayed under pressure against exhaust valves. Engine bearings for 1940 are of a new type, with bronze bonded babbitt linings. Crankshaft is more heavily counterbalanced for smoother operation.

Larger Generators Used

Three bodies are offered in the special line, and seven in the deluxe. New features previously mentioned on Plymouth and De Soto, and characteristic of the entire Chrysler line, are naturally incorporated in the Dodge series. Generators on all models, by the way, are of larger capacity—35 amperes—and carry both voltage and current controls; this is true of all cars for next year because of the general adoption of sealed-beam headlamps which take more current.

Several weeks ago mention was made here of new developments in heaters for 1940 models. One of these is the twin-unit system developed by Chrysler engineers and offered as extra equipment on all models at a reported cost of around $45. Designed to fit back of the instrument panel, the device filters fresh air from outside the car, warms it to any desired degree, then distributes it throughout the interior with the aid of directional ducts at either side of the car. Seven different adjustments provide a complete range of operation, either for circulation of warmed air in cold weather or of fresh air in summer months. Air intake is through the regular cowl ventilator.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1937	1938	1939
Jan.	399,186	226,952	356,950
Feb.	383,900	202,597	317,517
March	519,022	238,447	389,489
April	553,231	237,929	354,263
May	540,377	210,174	313,214
June	521,153	189,402	324,235
July	456,909	150,450	218,478
7 mos.	3,373,778	1,455,951	2,274,146
Aug.	405,072	96,946	*99,000
Sept.	175,630	89,623	.....
Oct.	337,979	215,286	.....
Nov.	376,629	390,405	.....
Dec.	347,349	406,960	.....
Year	5,016,437	2,655,171	.....

*Estimated.

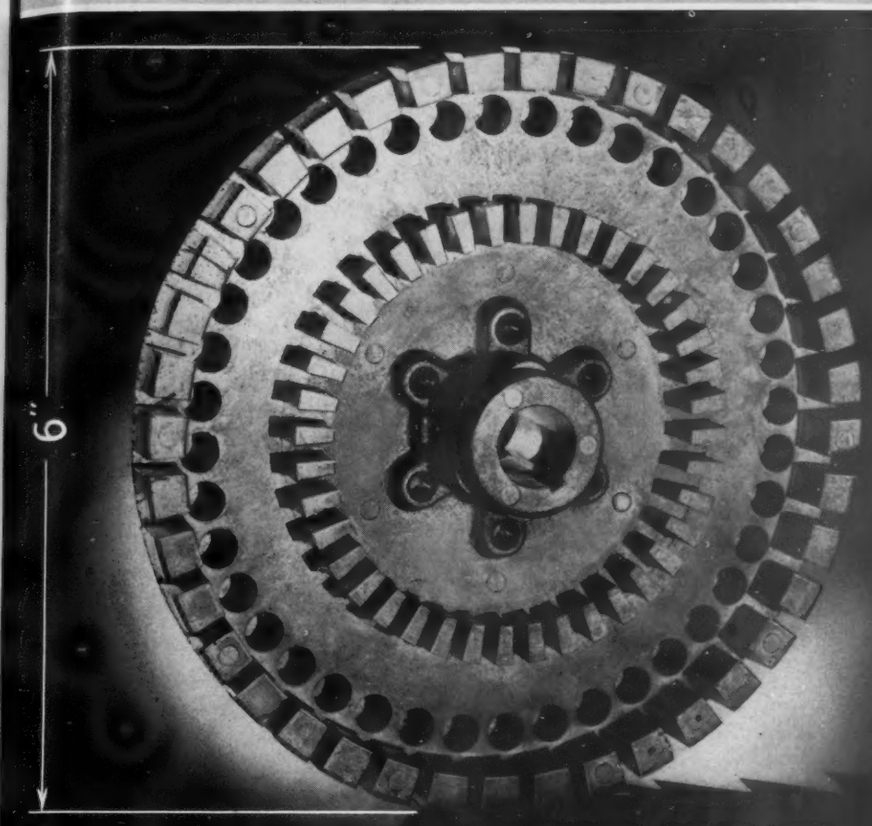
Estimated by *Ward's Reports*

Week ended:	1939	1938†
Aug. 19	12,955	23,940
Aug. 26	18,365	18,700
Sept. 2	25,240	22,165
Sept. 9	26,865	17,485
Sept. 16	41,245	16,100

†Comparable week.

	Week Ended	
	Sept. 16	Sept. 9
General Motors	10,825	7,850
Chrysler	17,925	10,425
Ford	1,600	.....
All others	10,895	8,590

ZINC ALLOY DIE CASTINGS



$11.30 SAVED
—By Die Casting This Part

When a well-known coin stamping machine was redesigned recently, the above part—the heart of the machine—was changed to a ZINC Alloy Die Casting. The saving in piece cost over the former "machined" part was $11.30. Consider *all* of the following features of this part as a die casting.

1. ECONOMY—There is no machining required on this casting other than the removal of the gate and tapping of the cored holes. The part illustrated here has received no further machine work. Here is rare complexity of design cast *in one piece.*

2. ACCURACY—The mechanism of the coin stamping machine is such that exceptionally close tolerances are demanded of this part. As a ZINC Alloy Die Casting, dimensions as close as .001" are held—and these dimensions will be the same in the first and last casting of a long production run.

3. STRENGTH—The strength of this casting is superior to that of the former part, yet there is a decided saving in weight. The smaller, rear view photograph shows the elimination of metal by the use of strengthening ribs.

This is not an unusual instance of die casting economy—hundreds of other manufacturers can cite similar savings in their products through the use of die cast parts. Consult any commercial die caster about ZINC Alloy Die Castings—or write to this Company.

• This casting, and many others you should see, will be exhibited in our BOOTH—L-311—at the—
NATIONAL METAL EXPOSITION
International Amphitheatre
CHICAGO—OCT. 23-27

THE NEW JERSEY ZINC COMPANY
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The Research was done, the Alloys were developed, and most Die Castings are made with

HORSE HEAD SPECIAL (99.99+% UNIFORM QUALITY) ZINC

Editorial

We Need a National Plan

■ AMONG the great nations of the world, the United States is substantially the only one that has no unified, thoroughly co-ordinated national plan. Unlike the nations that now are at war in Europe, the United States has no clear-cut vision as to just what it needs in order to promote the security and happiness of its people, both now and in the long future. This failure to conceive a national plan and work toward its execution is a source of potential danger to us at a time when sane thinking rather than emotionalism should prevail.

Sane thinking should convince us that we have no place in the present European war and that it will be to our best interest to follow truly neutral policies. This is indicated particularly as a result of our experience in the last war. Our sacrifices in that war achieved nothing worthwhile and got us nothing but ensuing grief. There could be no other result from our participation in the present war.

This is a dog-eat-dog world, and it is our obligation to formulate and carry out a national plan that will safeguard the happiness and security of our people under all conditions. It should be based on the exigencies of the present and the possibilities of the future. There is much to do if we are to attend to the adequate promotion and maintenance of our interests.

America's Opportunity Lies in the Western Hemisphere, not in Europe

By far the most important thing that we require is a realization that the arteries that carry the bloodstream that nourishes us as a nation and as individuals function within the complex system defined as "business," "commerce" and "trade." We need a fundamental realization that business needs constant encouragement so that it may expand and provide universal employment and a high standard of living.

It also should be realized that our interests are located not only within the confines of our national boundaries, but in the rest of the western hemisphere. In no sense are they in Europe. For example, right now we are being flooded with inquiries from South American countries which find themselves cut off from Europe as a source of many manufactured goods. Recently we were worrying over the inroads some foreign nations were making in our South American trade. Now is the time for the United States to study the South American markets and make lasting connections there.

Many Questions Are Involved in Formulating a National Plan

Can our national interests permit us much longer to refrain from exercising such pressure on Mexico as will result in the restoration of our property rights and re-establishment of satisfactory trade arrangements between the two countries? Does our national economy demand that the rich resources of the Philippine islands remain available to us? Are our various raw material resources adequate from a long-view angle, and does our future security depend on the acquisition of additional raw material reserves? Are we in a position to defend our rights and our interests in any emergency?

These are some of the questions that must be answered in the interest of national planning. If acted on wisely we can do much to soften the shock of the depression which will come after this war as it always has come after major wars of the past. In other words, instead of lunging headlong into a wartime economy, would it not be better to build wisely for the long future?

The BUSINESS TREND

Activity Index Reflects Holiday Interruption

■ REFLECTING the holiday interruption during the week ended Sept. 9, STEEL'S index declined 2.6 points to 83.7. In the comparable week last year the index stood at 66.8. It is interesting to note that the loss recorded by the index over the Labor day week was substantially less than the drop of 17.6 points in the index for the week ended July 8 and compares favorably with the decline of 9.5 points registered by the index during Memorial day week.

Comparisons with preceding years shows that the index declined 5.5 points during Labor day week in 1938; 10.5 points in 1937; 4.4 in 1936; 6.4 in 1935 and 5.2 in 1934.

The favorable comparison of the recent holiday decline in the index with previous similar periods would seem to indicate the strong upward tendency of industrial activity that is now underway.

Steelmaking operations receded 2 points to 62 per cent in the week ended Sept. 9. However, this was due entirely to the holiday interruption for the national steel rate last week rebounded sharply to over 70 per cent. The encouraging gain in steelworks operations following the holiday week exceeded the most optimistic predictions. The current rate is being maintained by stimulated demand from miscellaneous sources and further gains in steelmaking should develop throughout the remainder of the month as automotive builders step-up operations on 1940 models.

Automobile production recorded a small increase during the week ended Sept. 9 despite the loss of one working day. Automobile output in that week totaled 26,865 against 25,240 in the preceding period and 17,485 in the comparable week last year. Encouraging gains in motor car production are anticipated throughout the re-

STEEL'S INDEX OF ACTIVITY
IN IRON, STEEL AND METALWORKING INDUSTRIES
BASED UPON FREIGHT CAR LOADINGS, ELECTRIC POWER OUTPUT, AUTOMOBILE ASSEMBLIES (WARD'S REPORTS) AND STEELWORKS OPERATING RATE (STEEL). AVERAGE FOR 1926 EQUALS 100. WEIGHTED AS FOLLOWS: STEEL RATE 40, AND CARLOADINGS, POWER OUTPUT AND AUTO ASSEMBLIES EACH 20
NO ADJUSTMENTS MADE FOR SEASONAL OR OTHER TRENDS
PER CENT
COPYRIGHT 1939 STEEL
1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939
1938
1939

STEEL'S index of activity declined 2.6 ponts to 83.7 in the week ended Sept. 9:

Week ending	1939	1938
June 24	93.0	66.0
July 1	91.0	66.5
July 8	73.4	57.1
July 15	87.8	69.9
July 22	86.0	68.7
July 29	86.8	69.0
Aug. 5	83.5	66.9
Aug. 12	83.9	66.9
Aug. 19	82.2	70.5
Aug. 26	83.4	70.3
Sept. 2	86.3	72.3
Sept. 9	83.7	66.8

Mo. Data	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
Jan.	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1	87.6	104.1
Feb.	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5	99.2	111.2
March	92.6	71.2	114.4	88.7	83.1	78.9	44,5	54.2	80.4	98.6	114.0
April	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0	101.7	122.5
May	83.4	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.6	101.2	122.9
June	90.9	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1	95.8	120.3
July	83.5	66.2	110.4	100.1	75.3	63,7	77,1	47.1	67.3	79.9	115.2
Aug.	83.9	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4	85.4	116.9
Sept.	...	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3	83.7	110.5
Oct.	....	83.6	98.1	94.8	77.0	56.4	63,1	48.4	59.2	78.8	107.1
Nov.	....	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4	71.0	92.2
Dec.	....	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3	64.3	78.3

mainder of the month as producers increase assembly schedules on 1940 models.

Electric power output and revenue freight carloadings receded somewhat during the week ended Sept. 9 from the pre-holiday levels, but a sharp rebound to still higher levels is predicted for both these industrial indicators through the next 30 days.

CONSTRUCTION CONTRACTS GAIN IN AUGUST

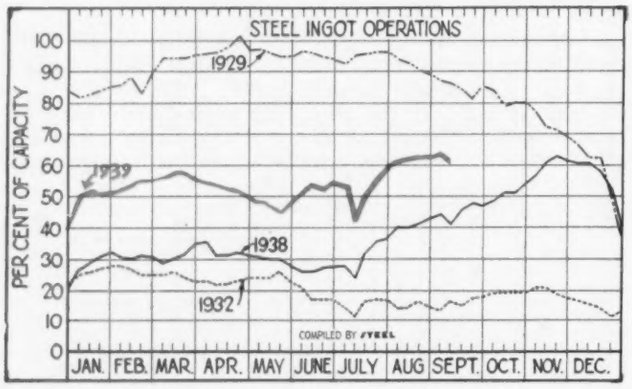
The value of construction awards in the 37 eastern states during August totaled $312,328,000, according to F. W. Dodge Corp. The showing during August extended the gains in general construction recorded in July, but remained under the April and May levels. The August figure compares with $299,883,000 in July and $313,141,000 in August, 1938. In the first eight months this year total construction awards were valued at $2,311,575,000, against $1,847,212,000 in the comparable period a year ago.

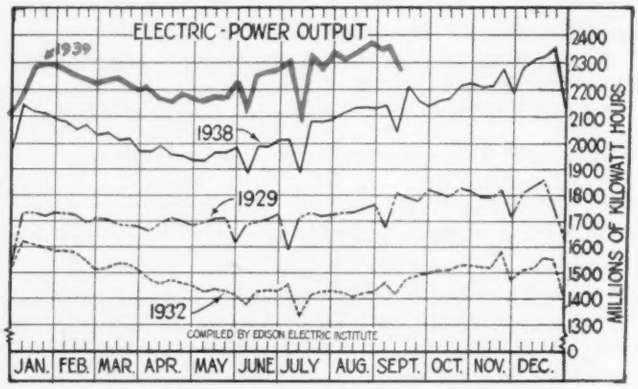
AUGUST INGOT OUTPUT GAINS

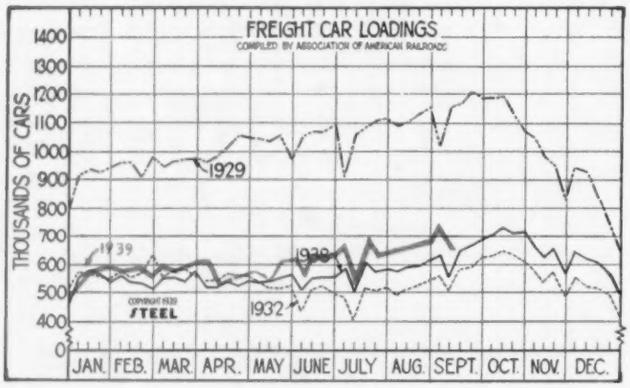
The daily average ingot production during August was 139,397 gross tons, based on the total output for the month of 3,763,718 gross tons reported by the American Iron and Steel institute. This compares with a daily average of 126,501 in July and 94,333 tons in August, 1938. Ingot operations last month averaged 62.22 per cent of capacity, against 52.40 per cent in July and 42.68 per cent in August last year. Production of steel ingots during August was at the highest level since September, 1937. For the first eight months this year ingot production totaled 25,556,179 tons, or an increase of 67 per cent over the 15,300,002 tons of ingots produced in the comparable period last year.

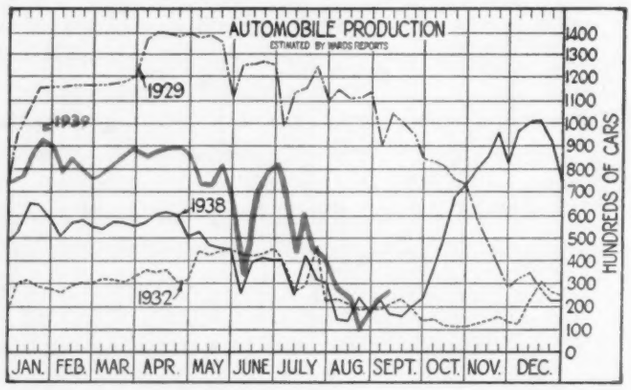
FINISHED STEEL SHIPMENTS UP SHARPLY

Shipments of finished steel during August by the United States Steel Corp. reached the highest level since September, 1937. Shipments last month totaled 803,822 tons, an increase of 127,513 tons, compared with the July shipments of 676,309 tons. A year ago the corporation shipped 558,634 tons of finished steel during August. In the first eight months this year shipments aggregated 5,873,397 tons, against 4,010,558 tons in the comparable 1938 period. The daily average shipments during August showed an increase of 1610 tons. Improvement recorded in steel shipments indicated an increase in demand from miscellaneous sources since automotive interest did not take deliveries on a large scale last month.

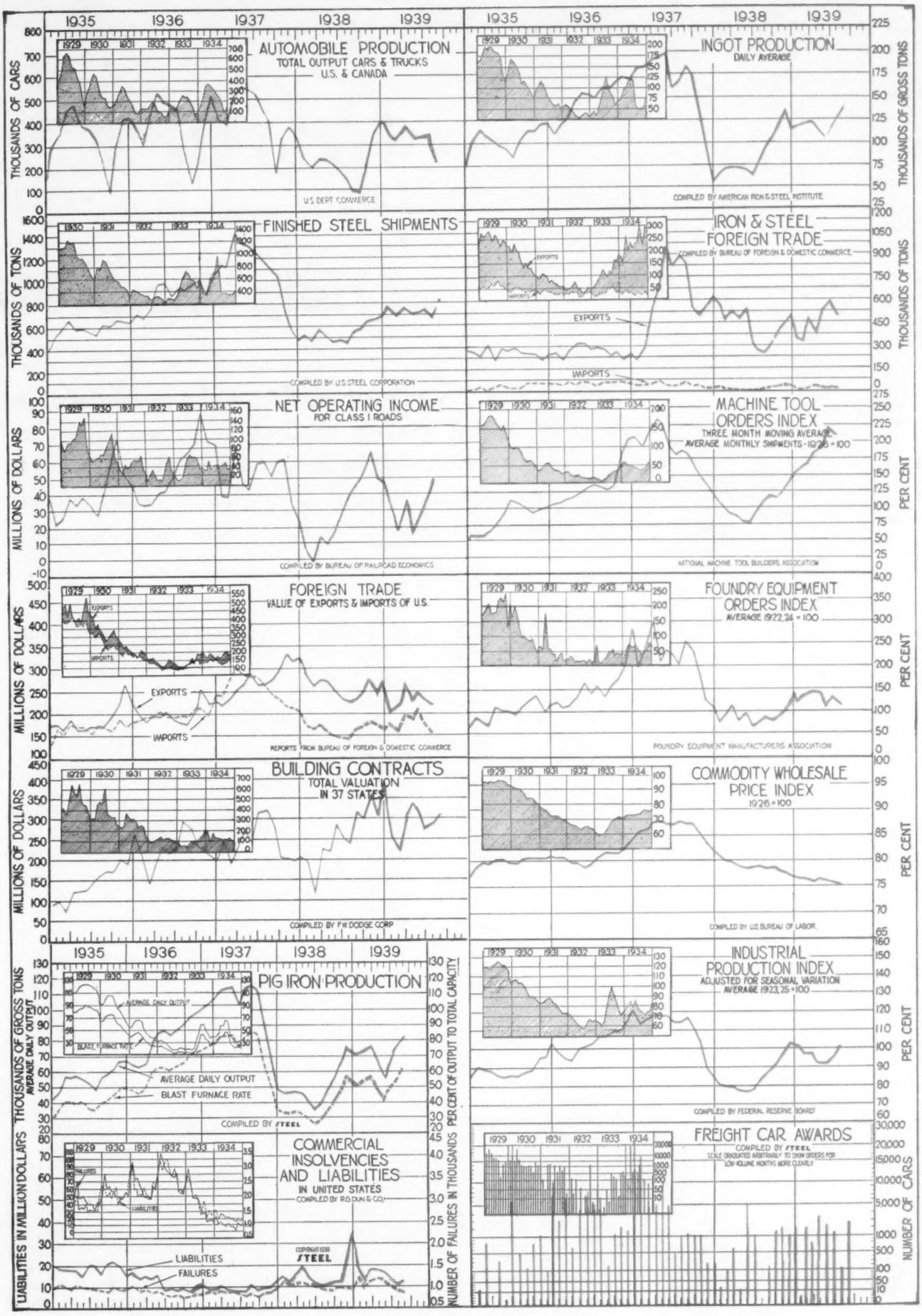


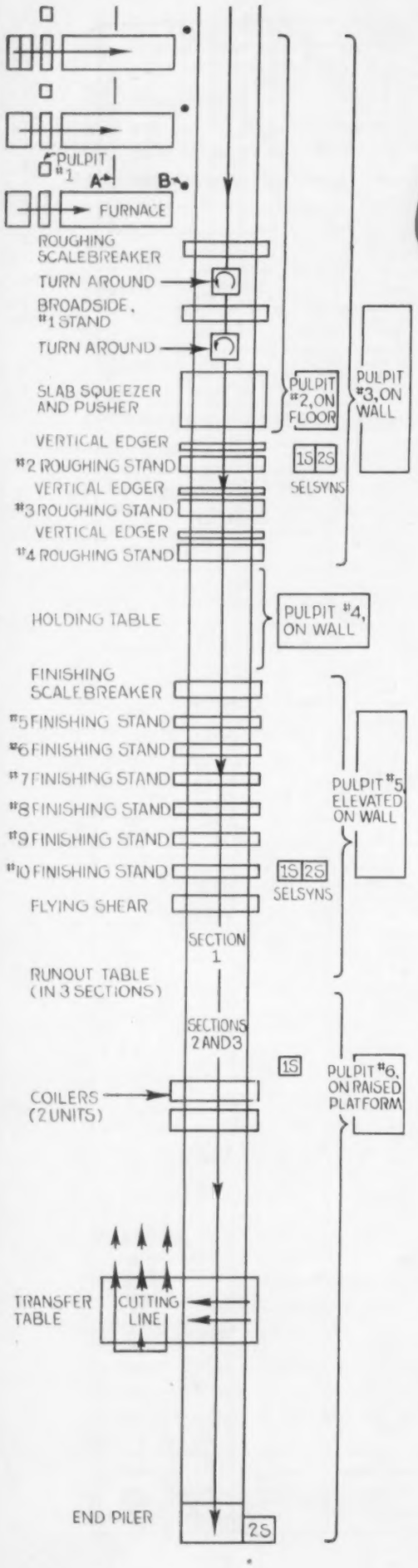






Week ending	Steelworks Operating Rate Per Cent 1939	1938	1932	1929	Electric Power Output Million KWH 1939	1938	1932	Freight Car Loadings Thousands of Cars 1929	1939	1938	1932	1929	Weekly Auto Output 1939	1938	1932	1929
June 3	52.0	25.5	21.0	95.0	2,114	1,879	1,381	1,615	568	503	447	972	32,445	26,980	44,116	111,372
June 10	53.5	25.5	17.0	96.5	2,257	1,992	1,435	1,690	635	554	502	1,055	65,265	40,175	43,491	125,307
June 17	52.5	27.0	17.0	96.0	2,265	1,991	1,441	1,699	638	556	518	1,069	78,305	41,790	44,121	126,125
June 24	54.5	28.0	17.0	94.0	2,285	2,019	1,440	1,723	643	559	499	1,096	81,070	40,918	45,110	125,736
July 1	54.0	28.0	14.5	93.0	2,300	2,015	1,456	1,592	666	559	480	909	70,663	40,945	40,291	98,746
July 8	42.0	24.0	12.0	95.0	2,078	1,881	1,341	1,712	559	501	416	1,065	42,784	25,375	26,560	113,586
July 15	50.5	32.0	15.5	95.5	2,234	2,084	1,415	1,727	674	602	504	1,079	61,610	42,010	29,870	115,075
July 22	56.5	36.0	16.5	96.0	2,295	2,085	1,433	1,723	657	581	502	1,101	47,420	32,070	46,375	123,512
July 29	60.0	37.0	16.5	96.0	2,342	2,094	1,440	1,725	660	589	511	1,104	40,595	30,390	22,461	110,163
Aug. 5	60.0	40.0	14.5	94.0	2,325	2,116	1,426	1,730	661	584	497	1,091	28,250	14,771	23,591	114,364
Aug. 12	62.0	40.0	14.5	93.0	2,333	2,134	1,415	1,733	661	589	512	1,100	24,875	13,790	21,162	111,939
Aug. 19	63.5	41.5	15.5	90.0	2,368	2,139	1,431	1,750	674	598	518	1,136	12,955	23,940	19,568	111,902
Aug. 26	63.5	43.5	14.5	89.0	2,355	2,134	1,436	1,762	689	621	538	1,160	18,365	18,700	19,896	113,316
Sept. 2	64.0	44.5	13.5	87.5	2,357	2,149	1,464	1,675	722	648	561	1,017	25,240	22,165	19,561	90,913
Sept. 9	62.0	41.5	15.5	86.0	2,290	2,048	1,423	1,806	667	569	501	1,153	26,865	17,485	21,586	104,351


1935 1936 1937 1938 1939
AUTOMOBILE PRODUCTION
TOTAL OUTPUT CARS & TRUCKS U.S. & CANADA
THOUSANDS OF CARS
U.S. DEPT COMMERCE
INGOT PRODUCTION
DAILY AVERAGE
THOUSANDS OF GROSS TONS
COMPILED BY AMERICAN IRON & STEEL INSTITUTE
FINISHED STEEL SHIPMENTS
THOUSANDS OF TONS
COMPILED BY U.S. STEEL CORPORATION
IRON & STEEL FOREIGN TRADE
COMPILED BY BUREAU OF FOREIGN & DOMESTIC COMMERCE
EXPORTS
IMPORTS
NET OPERATING INCOME
FOR CLASS I ROADS
MILLIONS OF DOLLARS
COMPILED BY BUREAU OF RAILROAD ECONOMICS
MACHINE TOOL ORDERS INDEX
THREE MONTH MOVING AVERAGE
AVERAGE MONTHLY SHIPMENTS-1925 = 100
PER CENT
NATIONAL MACHINE TOOL BUILDERS ASSOCIATION
FOREIGN TRADE
VALUE OF EXPORTS & IMPORTS OF U.S.
REPORTS FROM BUREAU OF FOREIGN & DOMESTIC COMMERCE
FOUNDRY EQUIPMENT ORDERS INDEX
AVERAGE 1922-24 = 100
FOUNDRY EQUIPMENT MANUFACTURERS ASSOCIATION
BUILDING CONTRACTS
TOTAL VALUATION IN 37 STATES
COMPILED BY F.W. DODGE CORP
COMMODITY WHOLESALE PRICE INDEX
1926 = 100
COMPILED BY U.S. BUREAU OF LABOR
INDUSTRIAL PRODUCTION INDEX
ADJUSTED FOR SEASONAL VARIATION
AVERAGE 1923-25 = 100
COMPILED BY FEDERAL RESERVE BOARD
PIG IRON PRODUCTION
THOUSANDS OF GROSS TONS AVERAGE DAILY OUTPUT
PER CENT OF OUTPUT TO TOTAL CAPACITY
AVERAGE DAILY OUTPUT
BLAST FURNACE RATE
COMPILED BY STEEL
FREIGHT CAR AWARDS
COMPILED BY STEEL
SCALE GRADUATED ARBITRARILY TO SHOW ORDERS FOR LOW-VOLUME MONTHS MORE CLEARLY
NUMBER OF CARS
COMMERCIAL INSOLVENCIES AND LIABILITIES IN UNITED STATES
COMPILED BY R.G. DUN & CO.
LIABILITIES IN MILLION DOLLARS
NUMBER OF FAILURES IN THOUSANDS
LIABILITIES
FAILURES
COPYRIGHT 1939 STEEL



Co-ordinated

Help Strip Mill S

To enable huge strip mill to make the most of its high speed rolling equipment, operating controls are reduced to essentials and centered in six pulpits for easy manipulation. Also, meters show all power consumptions and speeds

■ RECENT establishment of two new rolling records at Republic Steel Corp.'s 98-inch continuous strip mill, Cleveland, is due in no small measure to extremely flexible operating controls and the fast operation of the mill which they make possible. On Aug. 10, 1939, a total of 1900 gross tons of finished coils, 35½ miles of steel averaging 55 inches in width, was hot-rolled in an 8-hour turn, bettering the previous record of 1887 tons.

The same plant made a new record for cold rolling on Aug. 16, turning out 801.4 tons, roughly 39½ miles of 40 to 63-inch strip. Former records were 655 and 707 tons. The new high mark was accomplished in slightly less than 7 hours' actual rolling time. Such records as these result not only from skill of operators and their smooth co-ordination, but are directly dependent upon the design of the mill and especially of the control equipment and its operation. For this reason, a description of the operating controls at the 98-inch continuous hot mill may be of interest. See Fig. 1.

Controls are centered in six pulpits with the exception of screwdown controls, most of which are mounted on the individual stands. Fig. 2 shows screwdown controls at No. 1 stand broadside mill. Screwdowns are divided with a separate motor and drive being provided for each end of each mill. Position of upper roll is indicated by means of Selsyn indicators seen at the bottom of the control box in Fig. 2 and appearing as a row of figures. These register the number of turns of the screwdown drive motor, enabling the operator to tell the clearance between rolls in the stand. Settings are checked by running a short length of copper wire through the mill and measuring distance between flattened sides with a micrometer.

Fig. 1—Arrangement of control pulpits with equipment each controls in 98-inch hot mill line

Individual Control on Screwdowns

Just above the two Selsyn indicators are four palm-type pushbuttons used to jog the screwdowns up or down at either end of the stand. Near top of control box is a controller which runs both ends up or down simultaneously. This is the control ordinarily used, the jog buttons being employed to correct unequal rolling from side to side. Pushbuttons at upper left start and stop pump supplying oil to screwdowns. If pump should shut down for any reason, a red indicator just above these pushbuttons lights up.

Screwdown controls on the other stands are quite similar to the one just described except that on Nos. 2, 3 and 4 stands, control also is furnished for positioning vertical edgers with each roll separately ad-

Controls

Set New Records

For other articles in this series on rolling mill control, see STEEL, July 3, 1939, p. 52; July 17, 1939, p. 63; Aug. 7, 1939, p. 63; Aug. 28, 1939, p. 53. For general description of this mill, see STEEL, Mar. 21, 1938, p. 36 and Mar. 28, 1938, p. 38; electrical circuits Nov. 14, 1938, p. 46

Fig. 2—Typical set of screwdown controls mounted on end of mill stand and operated direct from floor

justable. Also, stands Nos. 3 and 4 have guide controls with a dial indicator to show their setting.

All other hot mill operating controls are centralized at the six pulpits previously mentioned. First of these is at the entry end of the reheating furnaces where entrance of slabs into the furnace and their discharge to the hot-mill line are controlled. Fig. 3 shows view of one of these pulpits, three identical ones being employed, one for each of the three furnaces.

At each of these stations, operator has control of dual depilers and pushers. Since each furnace has provision for two lines of slabs, hydraulic depiler and motor operated pusher are each divided into two units which can be operated separately or together. With slabs placed on the depiler by a crane, operator moves one or both of the tali handles shown at the left in Fig. 3, operating the hydraulic mechanism to bring the top slab on a level with the furnace bed.

Dual Operation

An individual controller is provided for each pusher and a third controller for operating both pushers simultaneously when long slabs are being fed full width of furnace. Valve operating depiler similarly can be hooked together mechanically to raise and lower both depilers when handling long slabs. Operator pushes a slab into the furnace whenever a signal lamp on the pulpit lights.

To limit maximum electrical demand in the mill, a unique system is employed. Three signal lights—one red, one green and one white—on No. 1 pulpit tell the operator the position of the demand limiter which automatically shuts off power to pushers whenever the mill load has reached the maximum limit set for the 30 minute demand period. The green light signals "go ahead." White indicates the power is on but the control has not been shifted from the motor room to control pulpit. Red indicates power has been disconnected either by the demand limiter or circuit breakers. Shutting off power on the pushers automatically controls entire mill load because if slab pushers do not operate, no slabs are delivered from the furnace and there is no rolling load on the mill stands.

A similar system of indicating lights is used throughout all pulpits, the red, green and white lights readily being visible in Figs. 9 and 10. Some such system is necessary because of the dual control provided, one set of controls being furnished at main switchboard in motor room and another set at operating positions in control pulpits. The white indicators show control has not been switched from motor room to pulpit. The green lights indicate all breakers closed and power applied. Red indicators show breakers have opened on account of overload or some other reason.

Going back to No. 1 pulpit, of course each time a slab is charged into the furnace, another one at the opposite end of the line is pushed out of the furnace onto the mill table. Before the slab can come out, however, the furnace doors must be raised. At point B (see Fig. 1) there are two controls— one for each of the two doors. In the first position, the doors are interlocked with the pusher control so they open automatically when the pusher is actuated. In the second position, the door is raised anyhow, permitting removal of any slabs in the furnace.

Each Furnace Has Panel

Each furnace has a panel at A for furnace controls. These include an air-to-gas indicator for each of the three zones in the furnace, a meter indicating pressure in the hydraulic system which operates the valves in the air-ratio control, automatic furnace temperature and air-ratio control for each of the three zones and switch with pushbuttons to change the control from automatic to hand.

After discharge from furnaces, slabs start down the lineup of equipment shown in Fig. 1. As will be

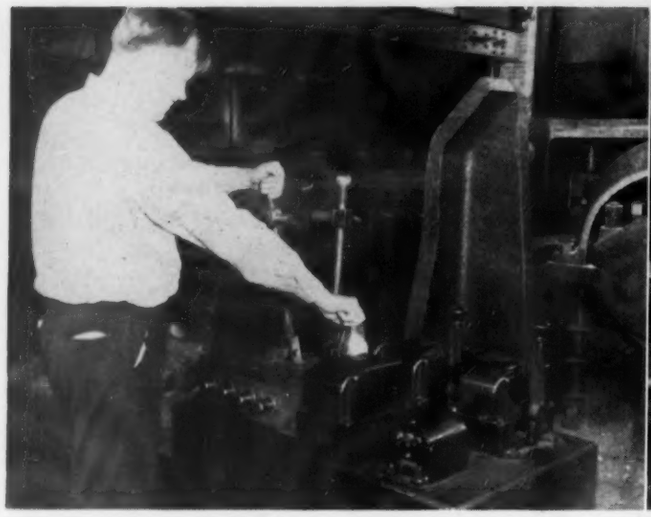


Fig. 3—Pulpit No. 1 at entry side of reheating furnace

Fig. 4—Pulpit No. 2 opposite slab squeezer on floor of mill

noted, sequence of equipment includes roughing scalebreaker, turn around, broadside No. 1 stand, turn around, squeezer and slab pusher, No. 2 roughing stand, No. 3 roughing, No. 4 roughing stand, all up to No. 2 stand being controlled from pulpit No. 2 shown in Fig. 4. This pulpit is on the floor directly opposite the squeezer and slab pusher where operator has view of entry side of the No. 2 roughing stand.

Operating controls in this pulpit, No. 2, include signal buttons to No. 1 pulpit, three table controls—one from each furnace, controls for roughing mill approach table, for scalebreaker guides, scalebreaker and broadside screwdowns including four jog palm-type pushbuttons, broadside screwdown clutch control (either one or both sides can be operated), guides for various tables, slab turn arounds, spray controls, and for four oil pumps supplying power to turn arounds. In addition there are four Selsyn screwdown indicators, one for each end of the broadside and scalebreaker. Also, slab pusher control is here. A meter is provided for pusher motor current to indicate if excessive power is being taken by the pusher.

Following a slab from the point where it drops on mill table, it passes endwise through the roughing scalebreaker, is turned sidewise in the turn around feeding the broadside mill, is turned endwise again after leaving broadside mill and enters the slab squeezer. From here, slab is delivered to table at entry side of vertical edger and No. 2 roughing mill, table is stopped and slab pusher actuated to feed the slab into the mill.

Controls Duplicated

All the controls at the No. 2 pulpit are also duplicated at No. 3 pulpit on the wall, which in addition includes all table controls between roughing stands and controls for main drives of scalebreaker, broadside mill, vertical edger and Nos. 2, 3 and 4 roughing stands. Shown in Fig. 5 are part of these controls. Meters indicate speeds and power consumption at each stand.

When rolling, the rougher and assistant on the floor direct operation of scalebreaker and the four roughing stands and adjust screwdowns on these units. Operation is only limited when excessive power is indicated in the pulpit.

The control in pulpit No. 3, part of which is shown at the left in Fig. 5, includes four panels. Besides meters and control already mentioned, there are meters for power and speed of the vertical edger just in front of No. 2 roughing stand with speed adjustment and start-stop controls. Here also are indicating lights in sets of three—white, green and yellow. White indicates control has been switched to pulpit from the motor room; green shows that the breaker is closed; yellow shows that the unit is running. On some units where a magnetic brake is employed, a fourth button (red) shows when the brake is applied.

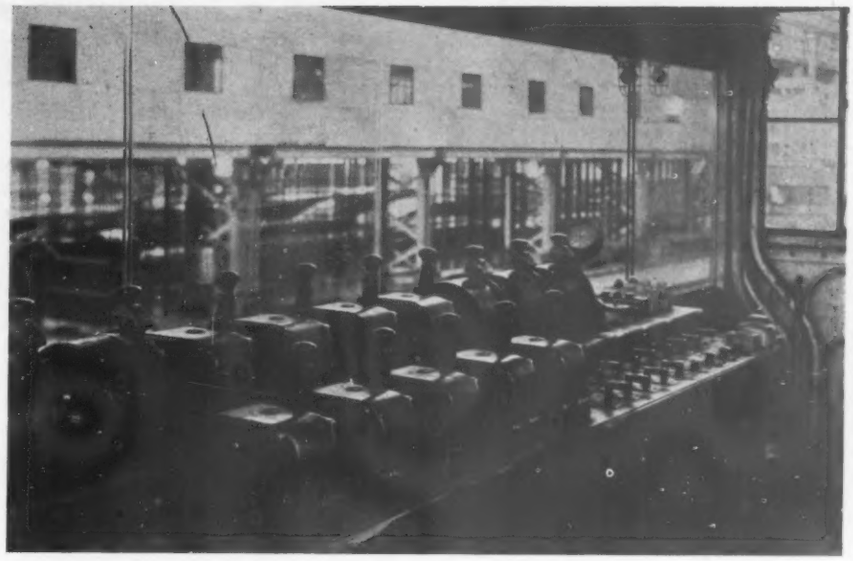
Selsyns Used

On the floor near pulpit No. 2 are two Selsyn signaling indicators shown in Fig. 7. Two sets of indicators of this type are employed to signal from various portions of the mill. One set of three Selsyns connects No. 2 pulpit, No. 10 finishing stand and coiler pit. The second set of Selsyns connects pulpit No. 2, No. 10 finishing stand and end piler at the end of the line. First set of Selsyns is used when making coils, second set when piling sheets.

When not signaling, pointers of

Fig. 5—View in roughing mill control pulpit No. 3 on wall

Fig. 6—Pulpit No. 6 opposite coilers on a raised platform



the units are at top as shown in Fig. 7. When operator desires to transmit a signal, he merely moves the pointer to that part of the circle labeled with the message he wishes to transmit. First set of Selsyns includes such items as "longer," "shorter," "heat pattern," "roll marks," "dirty top," "dirty bottom," with amounts given for signals "up," "down," "in" and "out." Moving the pointer on any Selsyn automatically lights the signal light on top of each unit in that group, calling operator. Upon receipt of message, operator turns his indicator to O.K. mark, the light goes out and system is ready for next signal.

Turn Around Is Automatic

When rolling the roughing scalebreaker, broadside mill and Nos. 2, 3 and 4 roughing stands operate at constant speeds set in pulpit No. 3. In some instances a slab may pass through the broadside mill without being turned around, depending upon size and shape of slab. When it is turned around, operator in pulpit No. 2 merely pushes a button which starts the lifting portion of the turnaround cycle, which then is completed automatically. Turning motion starts as soon as slab is clear of table. Dropping action also is started before the turning is complete, thus facilitating fast operation.

Similarly, operation of the slab squeezer has a hydraulic top clamp operated by a palm button on pulpit No. 2, the squeezing cycle being started also by a pushbutton with the cycle being completed automatically. Amount of squeeze is adjustable to finished dimensions shown by Selsyn indicators at pulpit No. 3. Here also are rheostats separate from the control board to permit adjustment of table speeds.

In the hot mill, there are four electric eyes with automatic indicating and recording instruments. The first is just ahead of the roughing scalebreaker to register temperature of slabs as they come from furnaces. Second unit is at the holding table, third at exit end of finishing stand, with fourth in coiler pit.

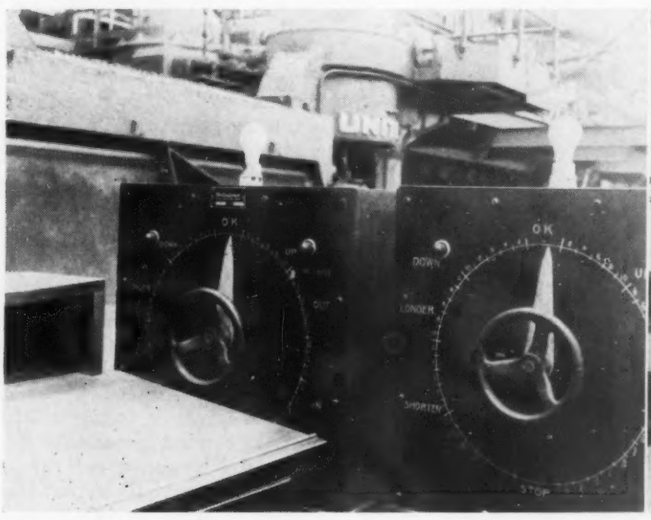
Electric Eye Tells Temperature

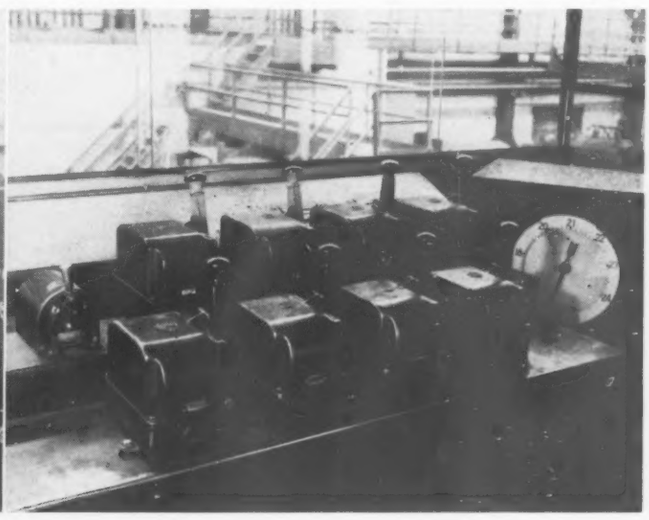
One of the most important of these is that at the holding table, registering in pulpit No. 4 and shown at right in Fig. 8. Since slab is held on table until it reaches correct temperature for entry into the finishing stands, this indicator is doubly important. Pulpit No. 4 is elevated on the wall directly opposite the holding table. Here are centralized controls for each of the two sections of the holding table. These include an individual control for each section and a dual control operating both sections simultaneously. Also there are controls for two guides, two sprays and one steam spray. Selsyn indicators register opening of guides. When slab has reached temperature set for finish rolling, operator in this pulpit sends it into the finishing scalebreaker, and control is taken over by operators in pulpit No. 5 elevated on the wall opposite finishing stands.

In pulpit No. 5 are possibly the most important controls in the entire rolling sequence as the finishing stands operate in tandem with material in two or more stands simultaneously, whereas the roughing stands have material in only one stand at a time and therefore do not need to be synchronized or their speeds so closely adjusted. With tandem rolling comes the need for

Fig. 8—Pulpit No. 4 on wall opposite holding table between roughing and finishing stands. Electric eye over table indicates temperatures on big dial at right

Fig. 7—Selsyn signalling boxes near pulpit No. 2 on mill floor





extremely careful adjustment of speeds of each stand to prevent breaks and buckles in the strip. Seen in Figs. 9 and 10 is a portion of the bench-type indicating and control equipment in pulpit No. 5. Appearance of this control bench is outstanding, all equipment being mounted on stainless steel panels with stainless steel enclosures. Here, as in the case of the other wall pulpits, heavy shatter-proof plate glass separates the booth from the mill proper, yet affords ample visibility.

Controls on Benchboard

Arrangement of control panels in this benchboard is as follows, going from right to left—the direction in which the strip passes in all these views: looper panel, finishing scalebreaker, finishing stands Nos. 5, 6, 7, 8, 9 and 10 in sequence, followed by main generator panel, flying shear and first section of runout table. Operating controls of loopers have been moved to the extreme left of Fig. 9 where they are opposite No. 10 stand. Here the operator has a better view of the last few stands, where operation of the loopers is most critical. The looper units raise an auxiliary roll between the finishing stands to take up any slack which may develop in the strip due to slight variation in speeds. Of course, as loops tend to develop, the speed of previous or succeeding stands is corrected as the operator moves slightly the vernier speed controls which are visible as long upright handles in Figs. 9 and 10. These vernier speed controls permit fast accurate adjustment of speeds of individual stands.

Examine for a minute a typical control panel such as No. 5 in Fig. 10. Numbers at top of panels indicate stands to which the control is connected. Panels for stands Nos. 5, 6, 7, 8, 9 and 10 are identical. In the upper lefthand corner of each is a meter indicating speed of the stand in revolutions per minute. In upper right is a kilowatt meter indicating power being drawn by that stand. At left in center is the vernier speed control, just to the right of which is the main rheostat, giving the coarse speed control. Further to the right is the rheostat for adjusting speed of mill table feeding that stand.

Bottom row of controls includes at the left a switch operating the motor circuit breaker and at right a switch for starting and stopping the mill table motor, with indicating lights above each switch. Switches and coarse speed rheostat have pistol grip handles. Speed indicating meters are equipped with magnifying lenses to permit reading accurately when presetting the stands.

Operates Dynamic Braking

At bottom center is a switch position which is blank on panels for scalebreaker and stands Nos. 5, 6 and 7. On stands Nos. 8, 9 and 10, there is a switch at this position to operate the dynamic braking circuits provided for those stands.

Between panels for No. 10 stand and the flying shear is the main generator control panel with meter at upper left corner indicating voltage of the direct-current bus. This meter registers 200-0-750 volts since the normal bus voltage of 600 is reduced to about 50 or less whenever a main drive motor breaker trips out as it is necessary to close main drive breakers at low voltage. Also, it sometimes is desirable to reverse direction of the stands, in which case the direct-current power is reversed.

At the upper right of this panel is a meter registering speed of strip in feet per minute as it leaves No. 10 stand. Just below these meters is a row of indicating lights for the six generators feeding the six main drive motors in the finishing stands. Each generator has a series of white, green and red indicating lights to indicate position of control breakers. Just below this in a third row is a switch for emergency trip and reset, the tensiometer switch and a main generator circuit switch. At lower left of this panel is a switch which reverses the bus voltage on the generator circuit. At lower right is a master switch operating the master rheostat to raise or lower the bus voltage.

Flying Shear

Next in line is the flying shear. This is an extremely flexible unit which permits strip to be cropped at front or rear, or it may be cut into lengths ranging from 13½ to 27 feet as it leaves the last finishing stand. Shear is synchronized with No. 10 finishing stand, a series of clutches and gears being provided to cut the various lengths.

Control panel for this unit can be seen next to the last at the left in Fig. 9. At top is a row of four meters, the one at left registering the shearing power in direct-current amperes, the next showing shearing speed in feet per minute. This last must coincide with the speed of strip as indicated on adjacent generator panel. Next meter is a differential speed indicator registering 900-0-900 feet per minute. This is used in conjunction with the fourth meter which registers gear speed and is used in setting the flying shear to cut the lengths desired.

Just below these meters is a limit switch selector, shear clutch indicating light, gear clutch indicating light and a switch for setting the shear for hand operation. Below these is a palm button for emergency stop, two speed adjusting controls and a palm button to cut strip when shear is set for hand operation. Bottom row of switches includes a series parallel selector for various speed ranges, a speed adjusting selector, a selector connecting tail end automatic crop to work from either No. 6 or No. 8 stand, a selector which sets speeds of shear motor and the automatic crop se-

(*Please turn to Page* 126)

Fig. 9—View in control pulpit No. 5 on wall opposite tandem finishing stands. Here are shown panels (right to left) for No. 10 stand, main generators, flying shear and first section of runout table with looper control on window ledge at extreme left

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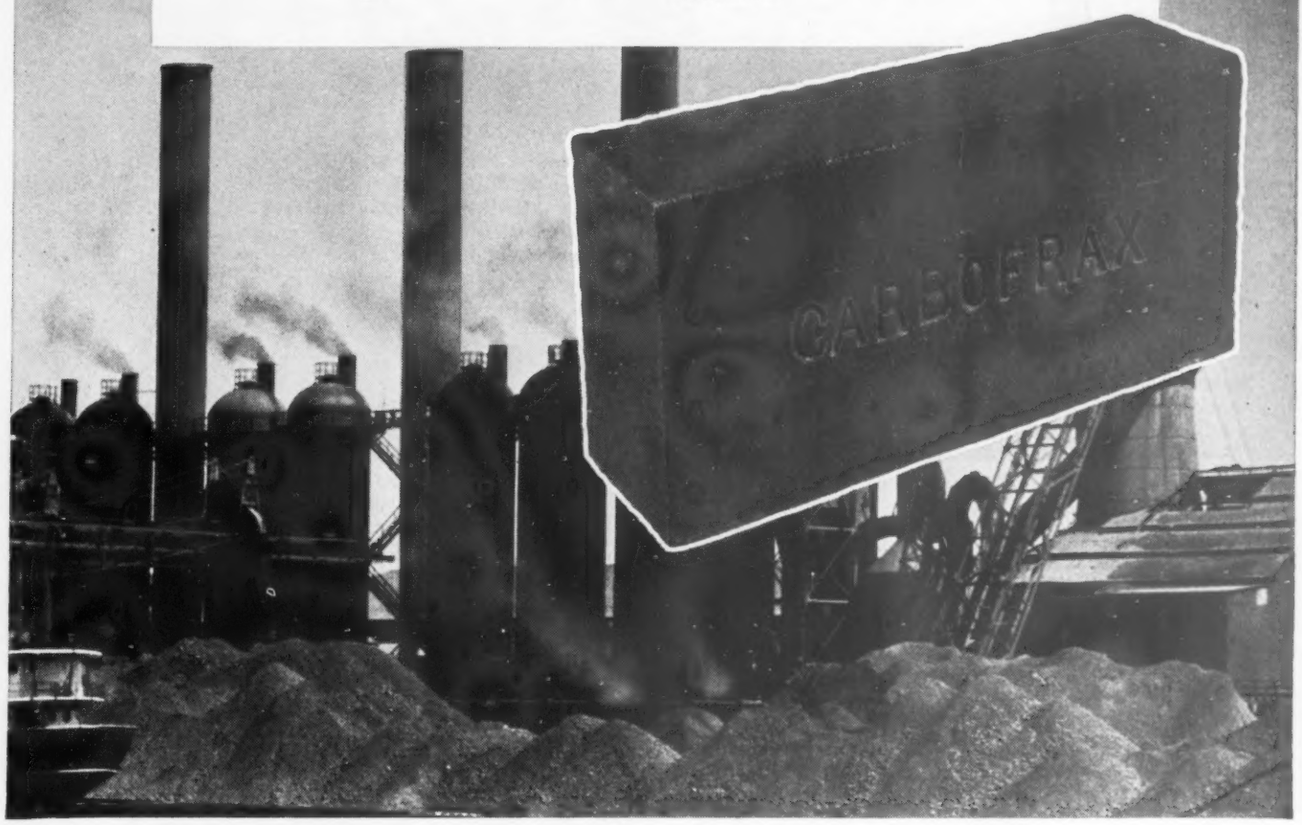

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Tantalum Heater Units

New heaters permit stronger acid concentration with correspondingly increased pickling speeds. Also afford fuel economies and more effective temperature control due to highly efficient heat transfer. Eliminate acid contamination

■ OF INCREASING interest to all steel producers is the use of tantalum coils as a means of heating pickling tanks. Tantalum units made by Fansteel Metallurgical Corp., North Chicago, Ill., have a number of important advantages which make them particularly suitable for such service.

The increasing use of muriatic or hydrochloric acid as a pickling agent, together with general modernization of pickling equipment and adoption of continuous pickling methods, has quickened the need for noncorroding heating equipment. Tantalum, an elementary metal, is entirely inert to hydrochloric acid, and therefore is a permanent material for the construction of heating units, as far as possibility of chemical attack is concerned. Tantalum also may be used safely with ammonium chloride flux solutions.

In fact, use of this material for such service permits much higher chemical concentration than ordinarily employed. This means that less heat is required in the pickling tank to produce the same pickling action on the work passing through the tank. This in turn permits an additional economy to be obtained in decreased amount of steam required and so saves fuel.

Fuel Costs Lowered

To afford a rough idea of the amount of reduction possible from this cause, tests have indicated that using a pickling tank with a tantalum heating unit and steam as the heating medium, it is possible to obtain equal pickling action with 100 pounds steam pressure producing 180-degree temperature in the pickling bath, 80 pound pressure with 150 degrees in the bath and even as low as 50 pounds steam pressure with 120 degrees as temperature of pickling bath. These reduced temperatures of course, were accompanied by increased acid concentration in each case. Thus savings in fuel may be significant.

Also, use of tantalum heating elements permits employing higher concentration of acid at ordinary temperatures to produce much faster pickling action in cases where this may be desired.

With larger output of stainless steel necessitating use of muriatic acid in pickling, the importance of an effective heating system for the muriatic bath points to increased use of tantalum heating units. This application is especially important as a tantalum heating unit will heat muriatic acid as efficiently as steam jets heat sulfuric acid.

High Heat Transfer Rate

Another important characteristic of tantalum heating coils is the extremely high rate of heat transfer through the metal. Thermal conductivity of tantalum is approximately the same as that of steel. However, where most metals rapidly lose conductivity because of films formed by scale, muriatic acid forms no scale on tantalum, so that the initial high rate of heat transfer is maintained. This means that heating services of tantalum heater units may be calculated without regard to "age" factor.

Coefficient of heat transfer, which in hydrochloric acid is remarkably high, may be favorably influenced further by the design and operation of heating unit.

Most acids appear to wet tantalum far more readily than other materials, and there is evidence that this characteristic may account for tantalum's unusually high rate

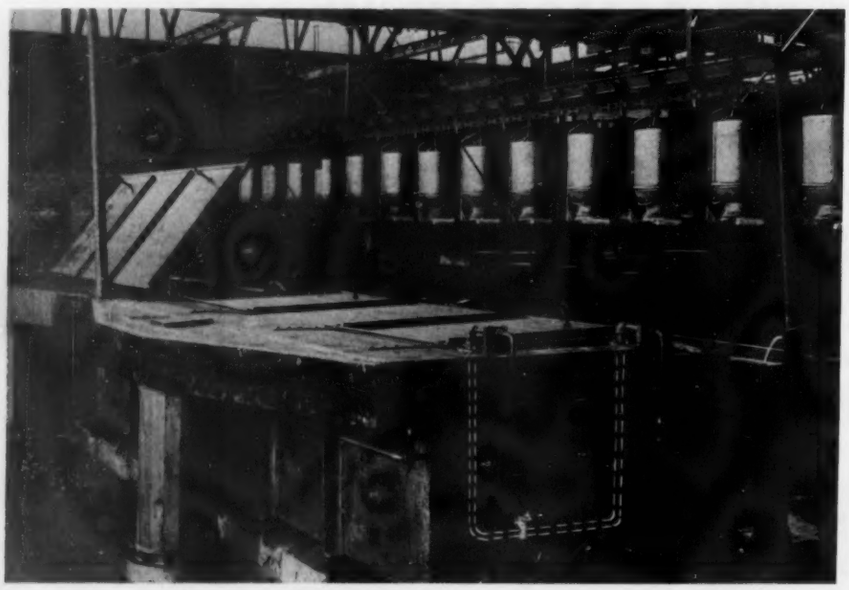

Fig. 1—Ten tanks equipped with tantalum immersion heaters here pickle 1000 to 1500 milk cans and parts daily. Appreciable savings in acid and steam have been noted since installation of the tantalum units. Location of unit in tank illustrated is shown by white dotted lines

RODINE, the world's standard pickle control (inhibitor), saves steel and acid, prevents noxious fumes and acid-brittleness, increases tonnage and cuts pickling costs.

DEOXIDINE, standard cleaner of metals, prepares various metal surfaces perfectly for applied finishes; cleans, etches slightly, and eradicates rust-producers.

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GRANODINE phosphate coatings prevent iron and steel from rusting under paint, and thus preserve both metal and finish. In addition, Therm-oil-GRANODINE prevents the scuffing and scoring of friction surfaces.

These ACP products, and others highly important in the fabricating and finishing of metals and metal products, have been developed and perfected in a quarter-century of painstaking research. Experienced ACP chemists are ready to aid you in the solution of your metal-treating problems.

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of heat transfer in pickling-tank work.

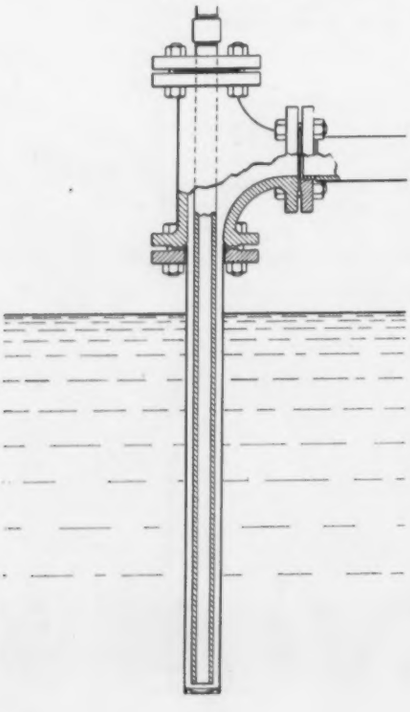
This high rate of heat transfer permits heating coils made of tantalum to have only 1/6 to 1/20 the heating area of ordinary metals. For example, in a heating coil used to boil a mixture of sulfuric and hydrochloric acid, the heating area of a tantalum coil is only 1/18 that of a base metal coil to do the same work. Because tantalum withstands higher steam pressure, reaction time also is shortened and production increased thereby.

Does Not Contaminate Solution

Another important advantage in pickling tank service is that the tantalum coil does not contaminate the pickling solution with dissolved metal. Thus pickling solutions need not be discarded so often, with considerably lower acid costs. On some types of work, this saving may be found quite significant. The high heating efficiency of the tantalum unit, besides saving steam, has another advantage. When heating up a tank at beginning of a run, or after a week-end shut down, the high rate of heat transfer possible permits rapidly bringing the pickling solution up to working temperature. This may be important in many instances.

Fast heat transfer also permits more accurate temperature control. Whereas variations from 20 to 30 degrees are frequently experienced

Fig. 2—Immersion type bayonet unit. Steam enters at top right, condensate being drawn up central pipe and out at extreme top. Illustrations courtesy Fansteel Metallurgical Corp., North Chicago, Ill.



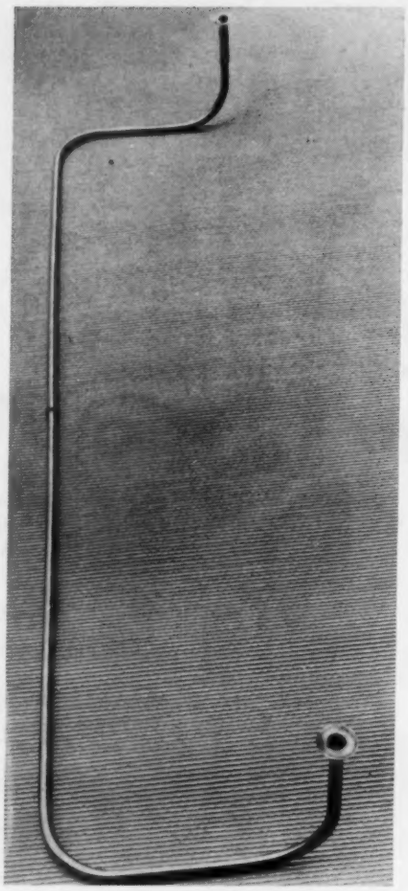


Fig. 3—Tantalum heaters for large tanks often are made of thin wall tubing bent to a U-shape to fit into protecting recesses in tank walls. 0.015-inch material safely withstanding steam pressures of 150 pounds per square inch

using steam jets to heat the solution, it is possible to maintain solution temperature within ½ a degree by employing tantalum heater units and automatic controls now available. Accurate temperature control of the pickling bath is extremely important. With a given acid concentration, a temperature above normal results in too fast a bite with resulting excess amount of steel lost in pickling bath and a pickling solution that will have to be renewed more often than necessary under normal conditions.

Bath Heating Rate Affects Output

On the other hand, if the pickling bath temperature is lower than it should be, the material is not pickled sufficiently, resulting in necessity of repickling and producing excessive costs.

Also, there is another factor which depends directly upon the heating capacity of the heating unit. In batch pickling, the amount of work that can be handled is directly dependent upon the ability of the heating unit to bring the bath quickly back to normal temperature when a cold charge is inserted. Here use of tantalum units with their extremely rapid heat transfer affords possibility of greatly increased production from pickling equipment compared with other methods of heating.

As stated previously, tantalum is a metallic element, produced in commercial bars and sheets by processes of chemistry and powder metallurgy. The powder particles are pressed into bars or ingots, then caused to grow together by sintering in vacuum furnaces. The pure metal is ductile and is rolled, drawn and formed cold. Its strength being comparable to cold rolled steel, reinforcing materials are not often necessary, and since the metal is not corroded in solutions where its use is recommended, sheet and tube sections between 0.010 and 0.020-inch are commonly used with ample margin of safety.

Heating units are fabricated from lap-welded tubing, seam welded at joints and arc welded to flanges. Tantalum equipment is fabricated by sheet metal technique to various shapes desired. Since the material is as strong as steel and is not weakened by corrosion, thin sheet or tubing is used with safety and economy.

Bayonet Heater Most Economical

The simplest and most economical form of tantalum tank heating equipment is the "bayonet" heater, shown in Figs. 2 and 4. This consists of a tantalum tube, flanged at one end and closed at the other. Within this tube is a smaller base metal tube for the introduction of steam. Condensate collects at the bottom of the tantalum tube when operated in a horizontal position, and runs outward through the tee, which is installed lower than the

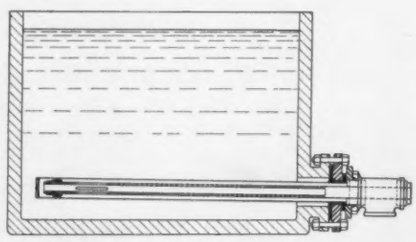


Fig. 4—Bayonet type unit inserted through side wall of tank, a convenient method of application highly recommended since it assures tube being covered with liquid at all times

closed end. Bayonet heaters are installed through side or bottom nozzles in the tank, and may be operated horizontally or vertically, full efficiency of the heating area being obtained when the unit is entirely submerged.

When side or bottom openings in

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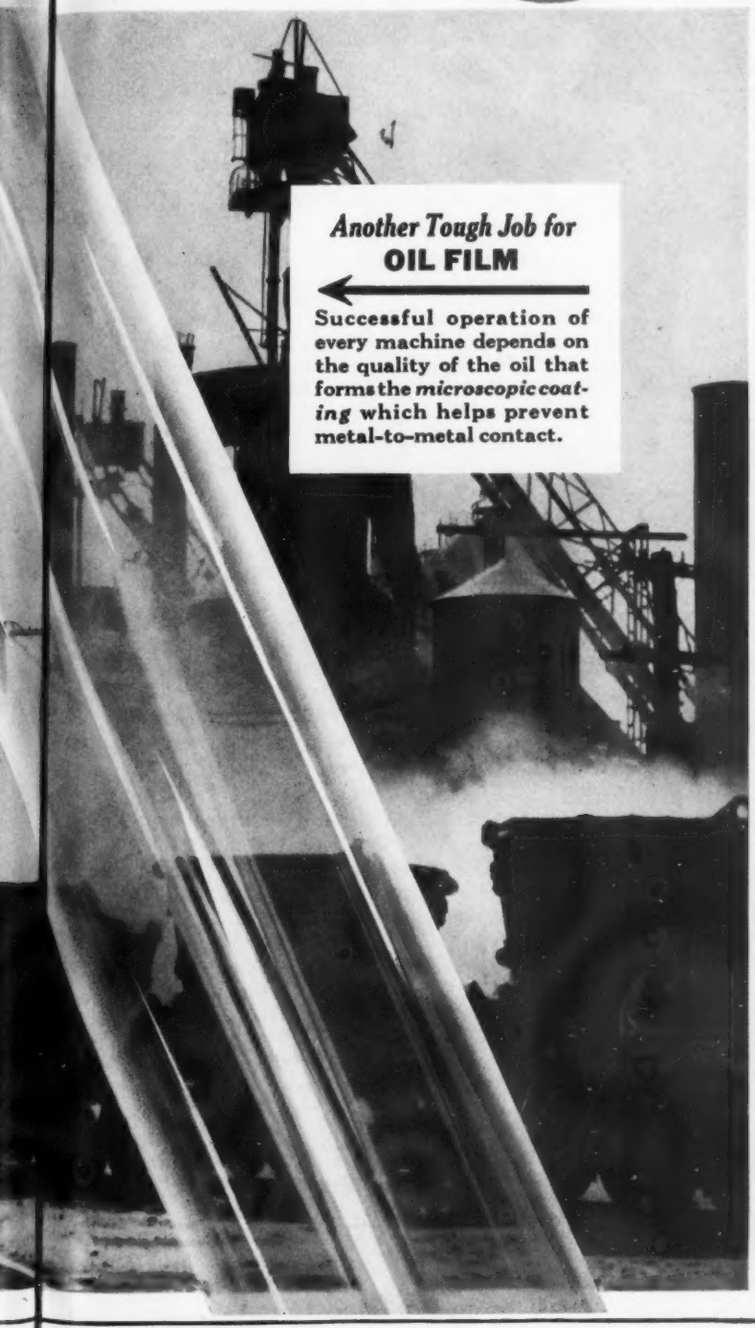

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the tank are not convenient, tantalum coils of "U" shape, Fig. 3, or other conventional construction are employed. A typical application is shown in Fig. 1.

In all cases, it is extremely important that the heater units be protected mechanically. It is this requirement that has resulted in tantalum heater units being employed more often on continuous picklers than on batch type. However, the tantalum heater unit is entirely satisfactory in batch picklers if mechanical protection is provided.

Uses Lower Steam Pressures

Heater units as described here are most economical when used with steam pressure between 80 and 150 pounds. The reason is that with higher steam pressures, so little tantalum need be used in construction of heater units that in comparison with other materials the cost of tantalum equipment is usually little if any more, and when maintenance and replacement are considered, it is less. With low steam pressures, however, full advantage of the high rate of heat transfer is not taken, which means that more tantalum tubing is necessary, increasing the original cost.

For instance, a small tantalum U-coil weighing 3 pounds replaced an alloy iron coil weighing 300 pounds on one installation where a muriatic acid pickling tank was being heated. To bring a cold bath to 180 degrees Fahr. required 9 hours with the iron coil. The same temperature is attained using the tantalum unit in 2½ hours, saving the time of an overnight attendant. Also, the iron coils were replaced every two months. The tantalum coil is permanent.

Another application of interest is in heating of ammonium chloride fluxing tanks where an aqueous solution is used. Here, tantalum has the important advantage over copper or other heating units in that where the copper material contaminates the solution, tantalum does no. In other heating solution applications where contamination is important, tantalum also may be used to advantage for this same reason.

Devises Method To Make Metal Sheets Resilient

■ Sheets of steel and other metals perforated and corrugated to make them resilient, and a method for producing these sheets are covered in a patent recently issued to Leonid A. Dunajeff and assigned to Commercial Ingredients Corp., 551 Fifth avenue, New York, as trustee.

Object of the invention, described in patent 2,158,929, is to provide a sheet having high resiliency and substantial elongation in all directions, combined with sufficient strength to withstand transverse loads, so that they can be used as a material for making seats and backs of chairs and similar furniture or as a foundation for upholstering.

Sheets of high resiliency, such as carbon or alloy steel, bronze, etc., are perforated to produce a meshlike structure, the perforations resulting in formation of a plurality of interconnecting bridges, and these bridges are then corrugated to form them into stretchable springs. The sheet thus formed can be heat treated to increase resiliency if made of carbon steel; with other metals and alloys resiliency can be imparted by cold working.

The resilient sheets can be prepared in large sheets, it is stated, and these then cut and trimmed to suit various applications. The corrugations project on one side of the sheet, leaving the other side smooth, and the smooth surface can be covered by some flexable inelastic protective material. A number of patterns and wide range of resiliency can be obtained by varying the shape and size of perforations, connecting bridges and corrugations.

♦

Odd-Lot Stock Trading Procedure Analyzed

■ *Odd-Lot Trading on New York Stock Exchange,* by Charles O. Hardy; cloth, 192 pages, 5¼ x 8 inches; published by the Brookings Institution, Washington; supplied by STEEL, Cleveland, for $1.50; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London S.W. 1.

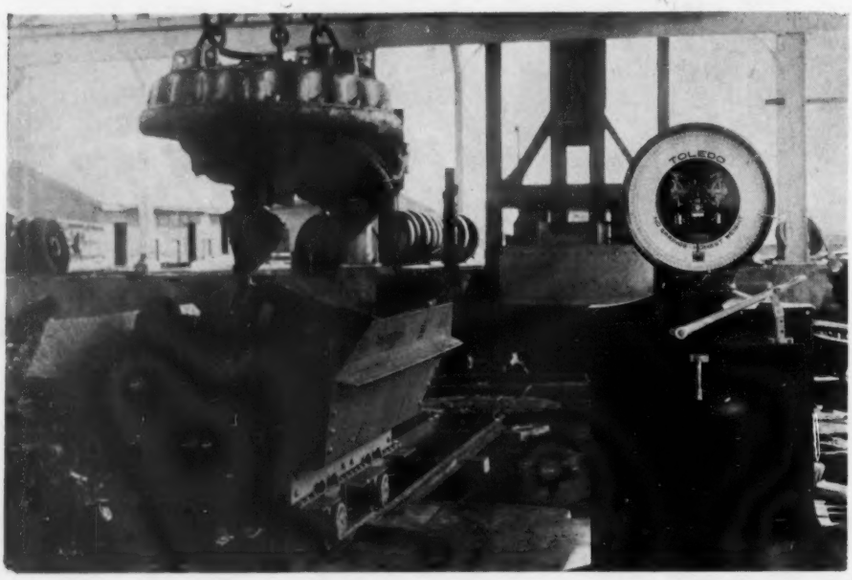
This volume presents results of an investigation of the structure and functioning of the odd-lot market of the New York stock exchange. It is of interest because of recent extension of regulatory activities of the federal government to cover issuance and distribution of securities and activities of organized stock exchanges.

Most previous publications on the technique of stock exchanges have been devoted to the "round lot" market because of the importance of its price-making functions, its larger volume and the fullness and promptness with which its operations are reported in the daily press.

The three principal odd-lot dealers co-operated in this investigation by opening their records to the author and furnished much information. The result has been a thorough analysis of this little understood branch of stock dealing through which a fairly large volume of securities is handled.

Entire responsibility for the findings rests with the author and his co-operating committee and the entire expense of the study was borne by the Brookings institution.

Dial Scale Speeds Loading of Furnace Charge



■ **To provide quick and accurate weight readings of furnace charges, Griffin Wheel Co., Chelsea, Mass., has installed this heavy-duty dial scale manufactured by the Toledo Scale Co., Toledo, O. Hopper car is loaded by a lifting magnet. Checking of weights is facilitated by facing the scale dial to the right in full view of the operators and equipping it with adjustable pointers**

NEW, REVOLUTIONARY J&L BESSEMER SCREW STOCK—RESULT OF J&L INVENTION —BESSEMER FLAME CONTROL*

LISTENING — that's part of the screw-machine operator's job. By his skill he knows the steady, high-pitched hum of the automatics that means thrifty production. And he knows, too, that to hold this production rate, hour upon hour, all the stock he feeds into the machines — bar after bar — ton after ton — must be precisely uniform in quality. Such is the way with the new J & L Bessemer Flame Control cold finished screw stock.

The precise uniformity of the new J & L steel is not a vision of human fancy. It is a fact based upon results obtained through months of practical operation of the new J & L Bessemer Flame Control process — a development that brings in a new era of steel-making — producing steels that process easier and more economically for you. Ask a J & L representative to give you more information about this Bessemer Flame Controlled cold finished screw stock. And remember, there is no extra charge for this new and revolutionary steel.

** Bessemer Flame Control, with an arrangement of photo-electric cells and other precision instruments, provides an instantaneous record of the rapid changes in the Bessemer flame. It is one of several methods on which patent applications have been filed by Jones & Laughlin Steel Corporation.*

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Slings for Safety

Properly used, as detailed here, wire-rope slings afford a fast convenient method of connecting cranes to large, heavy, bulky, awkward-shaped objects, thus greatly aiding safe operation

By J. M. GARRIS
Manager
Sling Department
Macwhyte Co.
Kenosha, Wisc.

■ BASICALLY there are only two ways of moving material; either the load is moved in contact with the earth or lifted and moved above the earth. The rake is an elementary example of the former and the shovel of the latter. Slings are used in connection with the second method of handling material as they are employed to support a load while it is hoisted and conveyed to a new resting place.

Many types and kinds of slings are in use, as slings have an extremely wide application. Some such device is used in practically every branch of industry at one point or another.

Abstract from *National Safety News*.

Consideration of safe sling practice involves a study of equipment itself and methods of its application. The material or work to be handled often definitely establishes the type of sling to be used. Also, there are a number of special devices for slinging which connect directly with the crane hook and therefore present little or no problem concerning safe practice. The majority of loads demand use of a flexible member, restricting the kinds of slings in general use to three main classes.

Three Main Classes of Slings

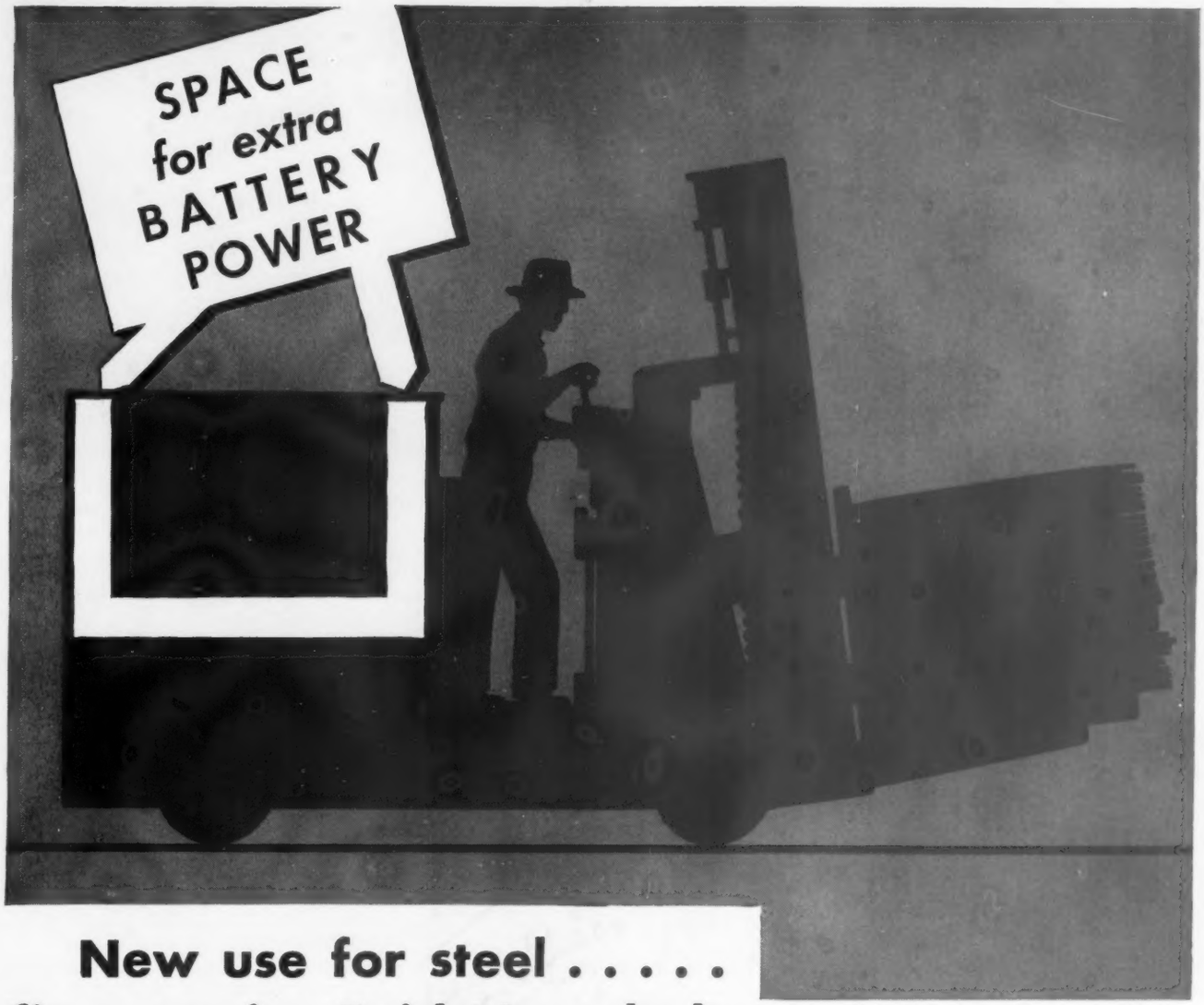
These three classes may be subdivided further because of variation in construction or materials used in their manufacture. The three main classes of slings are manilla rope, chain and wire rope.

Safety of slings depends upon consistent behavior of the material which enters into them. Slings of any kind are subject to more indeterminate stresses, abrasion and abuse than any other lifting equipment. Thus they present a serious problem wherever used and should be designed and used properly. Safe practice begins with the adoption of dependable materials.

Methods of slinging a load are three in number and are known as the *cradle or basket hitch; slipnoose*, choker or anchor hitch; and the *direct connection* with the burden by means of hooks, thimbles, links, shackles or sockets. Any one of these methods may be preferred in certain shops, or all of them may be used.

On the other hand, quite often one method is generally accepted in one

Large roll being lifted on a crane hook using an 8-part sling equipped with anchor hooks and 16-part wear members in a basket hitch, all are Macwhyte braided wire-rope slings



New use for steel . . . . . fits oversize Exide-Ironclads into standard electric trucks

WITH electric industrial truck batteries assembled in steel trays instead of wood there is a saving of so much space that substantially greater battery capacity can be installed in the battery compartment of a truck.

This new Exide-Ironclad development means greater power, higher speeds, livelier trucks, and more tonnage hauled per turn. Thus a new use for steel helps cut the handling cost of producing steel.

Built around these powerful Exide-Ironclads assembled in steel trays is the Exide System which helps further to speed up your handling service. It provides a scientific analysis of your trucking problem and the right battery for the job—plus auxiliary equipment that gets the most out of the battery. This consists of the Exide Discharge Indicator which warns when a battery is nearing discharge, and the Exide Charge Control Unit which controls the charging rate automatically, then cuts the circuit and signals when the charge is complete. Why not write for details?

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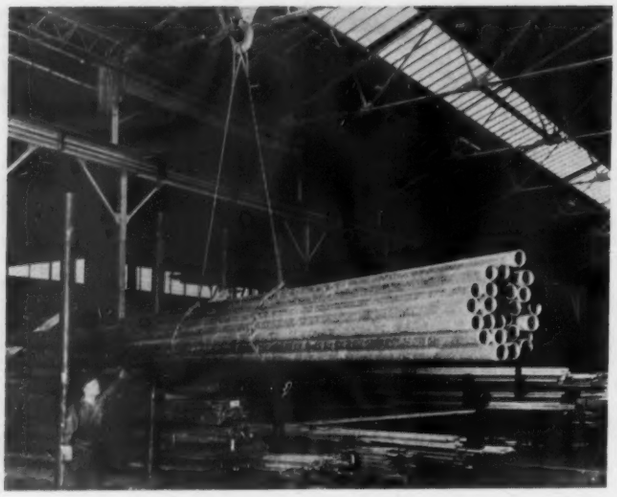
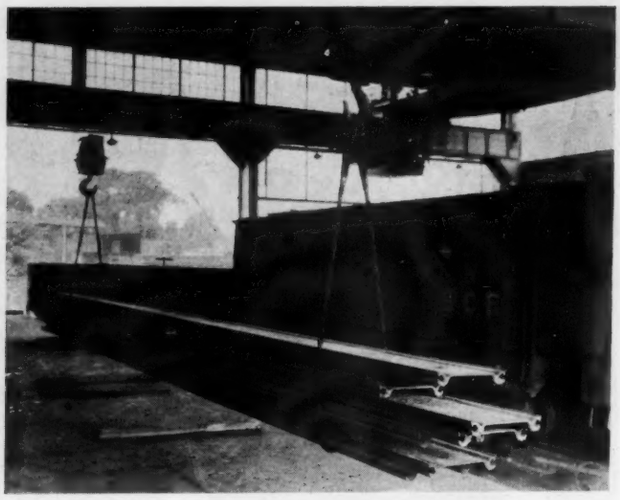
THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia

The World's Largest Manufacturers of Storage Batteries for Every Purpose

Exide Batteries of Canada, Limited, Toronto



Choker or anchor hitch. Lifting pipe with two Macwhyte Drew braided wire-rope slings. Rigged this way from one hook, there is no "sawing" action on sling elements. Compare this with the basket hitch at right



Steel piling handled with two crane hooks and braided wire-rope slings in a basket hitch. If not handled carefully by crane operator, a "sawing" action will develop and cause undue wear on the sling elements

locality and not used widely in another. It is highly probable that what is considered proper and safe practice by one operator may be thought unsafe by another.

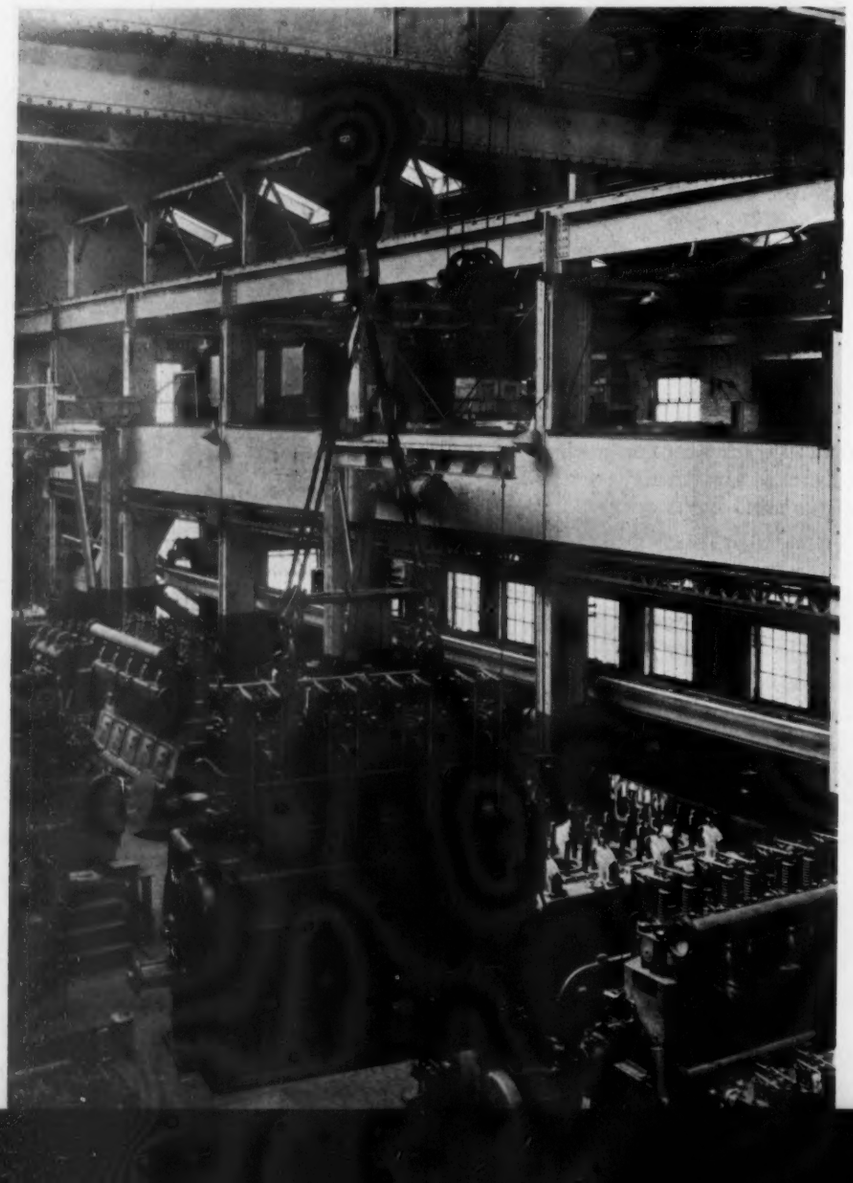
The ideal condition appears to be direct connection with the load since the sling body then is subject to no bending stresses or abrasive action. If the machine, flask or casting is fitted with eye-bolts, hooks, cored holes or lifting pads, any one of which provides for suspension with a sling, then proper protection of the sling is quite an easy matter. While slinging is receiving more and more consideration by designing engineers, the great majority of loads will ever continue to be a "catch-as-catch-can" proposition. The great variety of loads and limitations of equipment and conditions under which they must be handled often present problems that can be solved only by the ingenuity and resourcefulness of a trained rigger or an engineer conversant with sling work.

While direct connection is an excellent way of handling certain loads, it is possible to secure greater safety in general applications of slings by having the sling encircle the load. Permanent points of attachment are subject to wear and often deteriorate until they become the proverbial "weakest link." This is especially true of eye-bolts and threaded connections. If a 2, 3 or 4-point suspension is employed, the lateral pull upon them sets up stresses which cannot be avoided. Where the sling encircles the load, minimum sling wear and maximum safety are usually obtained.

Basket Hitch

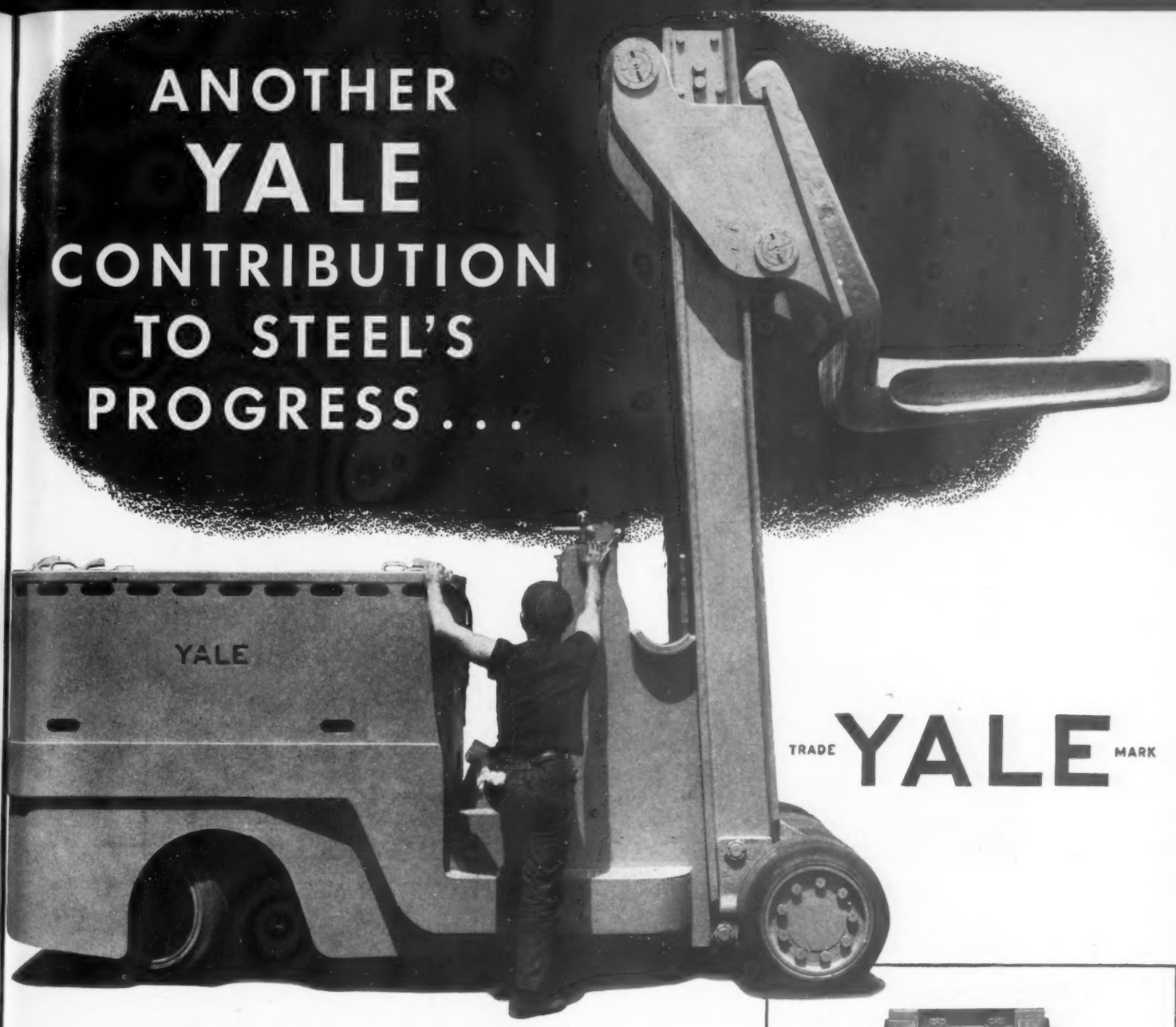
The cradle or basket hitch is generally used where a load can be lifted evenly. Next to direct connection, this method is least damaging to the sling itself. Loads can be handled safely in this manner if the inclusive angle does not exceed 60 degrees, and some types of slings will function fairly well at an inclusive angle of 90 degrees. Use of a lifting beam or strong-back permits appli-

(*Please turn to Page* 130)



Direct connection with load enables maximum strength of the sling elements to be developed. Here four braided wire-rope slings are lifting a huge engine. Note adjustable spacer bars which space sling elements in pairs for easy rigging

ANOTHER YALE CONTRIBUTION TO STEEL'S PROGRESS . . .



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Materials handling in the steel industry has gone through a major evolution in the last five years—Particularly in the new continuous mills. A few years ago 6,000 lb. coils were standard. Today, 25,000 lb. coils have to be coped with.

Progress on this scale has called for corresponding progress from equipment manufacturers. Yale's latest contribution is a fleet of giant 25,000 lb. cap. Ram Trucks recently delivered to one of the country's leading mills. Built to handle huge coils—these trucks feature many mechanical advances, some of which follow.

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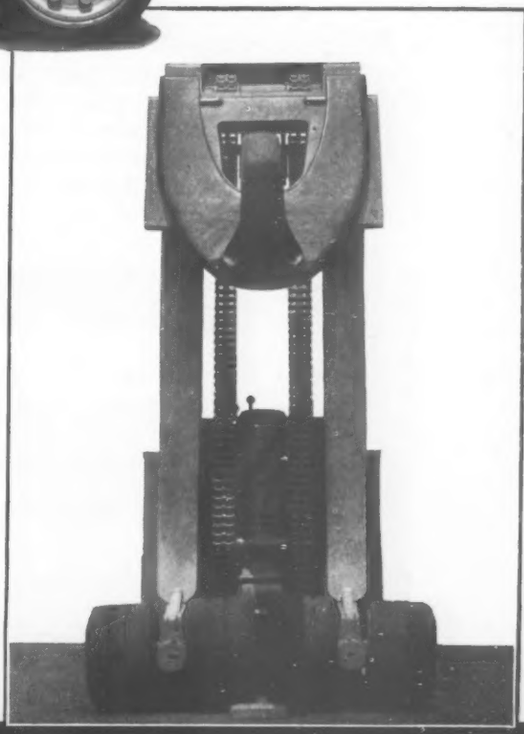
Hypoid Spur Geared Drive—No steering knuckles . . . fifth wheel rotating construction—Flame hardened gear teeth—Controlled articulating load wheels—Unit welded steel frame with 1½ inch thick steel side members—56 inches of load rubber—Yale Electric Steer (follow through type)—Lifting chains with ultimate strength of 210,000 lbs. . . . All are included on these trucks.

For as Steel progresses . . . so progresses Yale.



THE YALE & TOWNE MANUFACTURING COMPANY

PHILADELPHIA DIVISION • PHILADELPHIA, PA., U. S. A.

MANUFACTURERS OF ELECTRIC INDUSTRIAL TRUCKS • ELECTRIC HOISTS • CHAIN BLOCKS AND HAND LIFT TRUCKS IN ALL CAPACITIES

2 NEW FACTORIES Modern for Better

ELECTRODES — THAT'S ALL

Devoted exclusively to the manufacture of electrodes, two of the world's most modern electrode factories, now operating in full swing, produce all G-E electrodes. To assure strict uniformity, both plants are completely equipped with the latest streamlined production facilities. To make prompt shipment of all types and sizes without delay, they are located adjacent to steel mills—their principal source of raw material.

APPROVED BY AUTHORITIES

The high quality of these new modern G-E electrodes is evidenced by the fact that their use is permitted on work requiring the approval of Hartford Steam Boiler Inspection & Insurance Co., American Bureau of Shipping, Lloyd's of London, Southwestern Laboratories, and other recognized authorities.

NEW PRODUCTION FACILITIES
Provide new standards of uniformly high-grade electrodes

COMPETENT SUPERVISION
Of all manufacturing operations assures constant uniformity of product

GENERAL ELECTRIC

Now Make G-E Electrodes

Arc Welding

"SHOP-PROVED" BY GENERAL ELECTRIC

As further assurance of their ability to produce profitable results, G-E electrodes also are continually "shop-proved" by a most critical user—G-E shops. Keen competition compels General Electric to use the most efficient production tools obtainable. That's why G-E shops use more than a million pounds of G-E electrodes annually.

NATION-WIDE AVAILABILITY

National distribution service maintains local stocks for immediate delivery—thus minimizing the quantity a user needs to carry on hand to assure adequate supplies. You, too, may find it convenient and profitable to take advantage of this new, reliable source of outstanding electrode values. Call your G-E arc-welding distributor or G-E sales office for further information, a demonstration, samples, or help with your welding problems; or write General Electric, Schenectady, N. Y.

TRAINED RESEARCH STAFF
Continually makes sure that G-E electrodes are representative of the best that modern science can produce

A COMPLETE LINE
of G-E electrodes is available for mild steel, high-tensile steel, cast iron, and other welding work

GENERAL ELECTRIC

Hardening Gear Teeth

Flame hardening proves a flexible, economical method of developing required surface hardness on teeth of large gears. New machines provide accurate control of all factors, in process and assure uniform results

By DWIGHT VANDEVATE
Gleason Works
Rochester, N. Y.

■ FOR MANY years hardening the teeth of gears—particularly bevel gears—has occupied the attention of Gleason engineers. Heat treating larger size of bevel gears by the flame-hardening method appears the most satisfactory. Although a quenching press capable of handling gears up to 60 inches pitch diameter technically was a success, its cost of operation limited its use. Gears between 25 and 60 inches pitch diameter usually are made in comparatively small quantities, and the relatively high cost of heating such large gears in a gas furnace, together with cost of dies, was a serious obstacle. Furthermore, the application was limited to gears of fairly simple ring design.

Considerable development work has been done on the flame-hardening process using the oxyacetylene torch with tips to harden both sides of the tooth at the same time. It was discovered at an early date that hardening a single side at a time caused unequal stresses on the two sides of the tooth, resulting in excessive distortion. In addition, a drawing effect on the first side often was experienced after the second side was hardened.

Widens Field For Gears

Recently flame - hardening machines, such as those described here, have rapidly widened the field for hardened bevel gears. Today flame-hardened gears are used in paper mill machinery, coal pulverizers, oil well drilling and pumping equipment, steel mill machinery, boring mill table drives and many other applications. Many bevel gears are made with a complicated hub design and with flame-hardened teeth, often using steel castings. There no longer exists any necessity for 2-piece construction, using a hardened steel ring bolted to a cast iron or cast steel center.

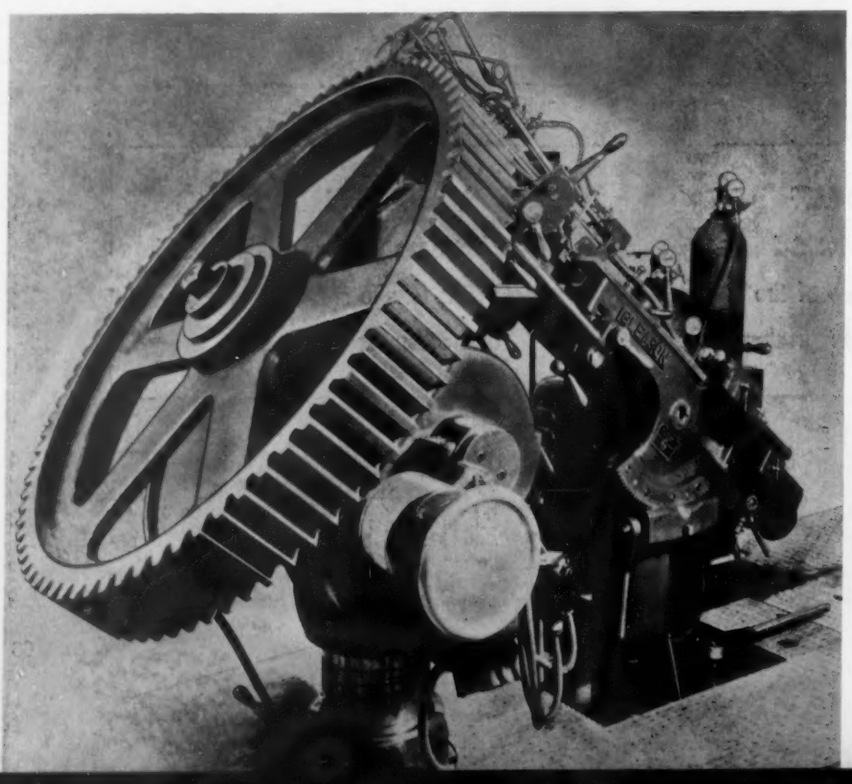
Machine Operated Torch

Since flame hardening of gear teeth by hand depends for its success on the human element, the machine-operated torch has come into wide use as it eliminates attendant variations from overheating, cracking and nonuniform hardness.

A typical machine for this type of work consists of a base holding the work and an upright which carries the burners as shown in accompanying illustrations. The workhead is stationary on the base, the upright being adjustable to and away from the workhead for the various sizes of gears. Workhead has universal angular adjustments, swinging on trunnions to any desired angle for holding the work. Vertical movement of workhead is by hydraulic power. Angular setting is by electric power, using a torque motor and suitable gear reduction. These power adjustments greatly accelerate the change from one job to another.

Burner column is positioned vertically by hydraulic power and angularly through a worm and sector using a crank wrench. Also, it can be swiveled to any desired angle. Burners are mounted on a slide on this column. In most cases burners have waterjackets to keep them from reaching excessive temperatures. When extremely fine pitch

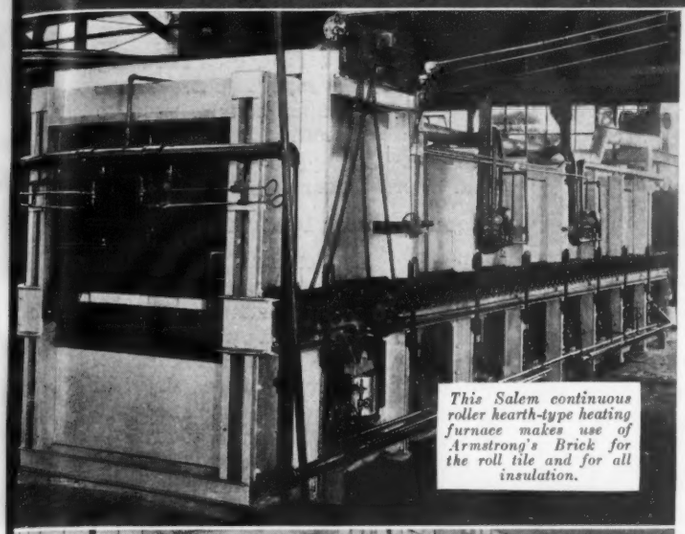
From paper presented at twenty-third annual meeting of American Gear Manufacturer's Association at Virginia Beach, Va.



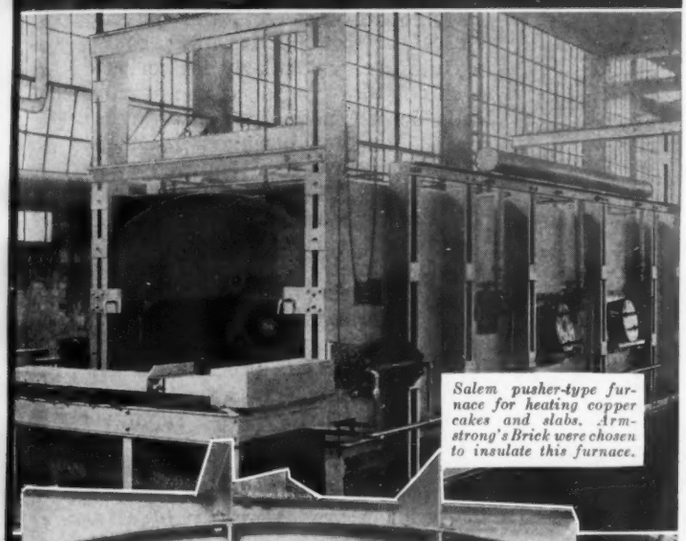
New torch-hardening machines employ an automatic preheating cycle and controlled hardening stroke with different speeds being available for various portions of the stroke giving tremendous flexibility

IN THESE 4 SALEM FURNACES

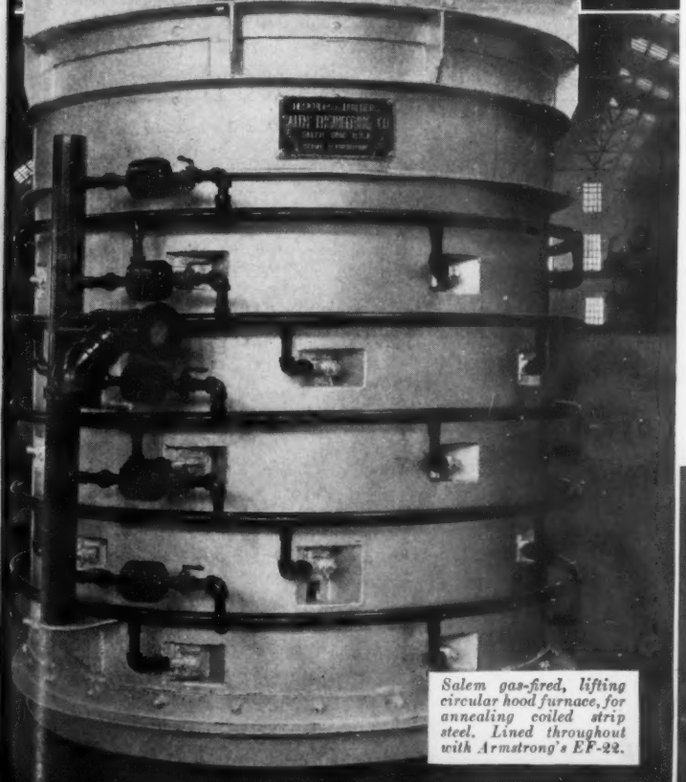
Armstrong's Brick aid efficiency!



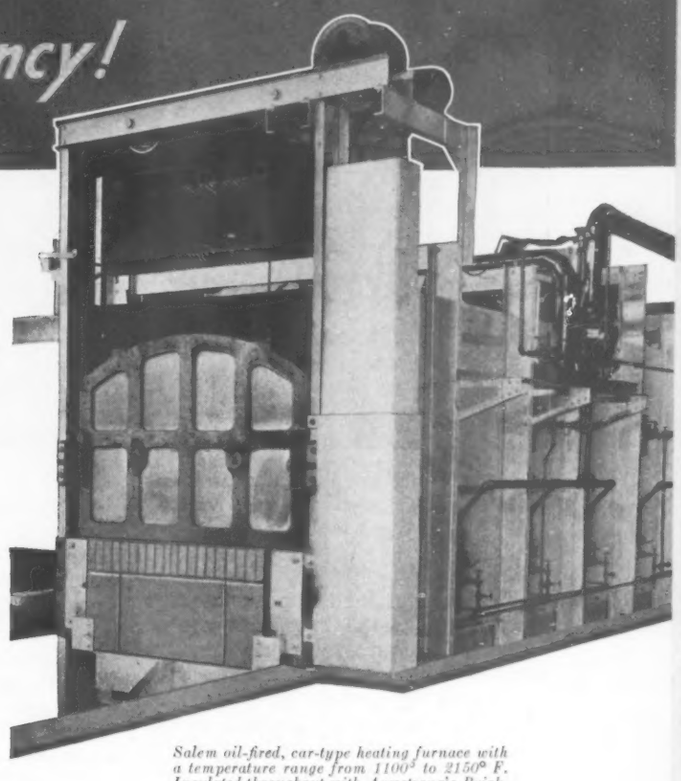
This Salem continuous roller hearth-type heating furnace makes use of Armstrong's Brick for the roll tile and for all insulation.



Salem pusher-type furnace for heating copper cakes and slabs. Armstrong's Brick were chosen to insulate this furnace.



Salem gas-fired, lifting circular hood furnace, for annealing coiled strip steel. Lined throughout with Armstrong's EF-22.



Salem oil-fired, car-type heating furnace with a temperature range from 1100° to 2150° F. Insulated throughout with Armstrong's Brick.

SHOWN here are four different types of furnaces built by the Salem Engineering Company, of Salem, Ohio. Designed for various types of heating, with temperatures up to 2150° F., each is insulated with Armstrong's Brick for economy and better temperature control.

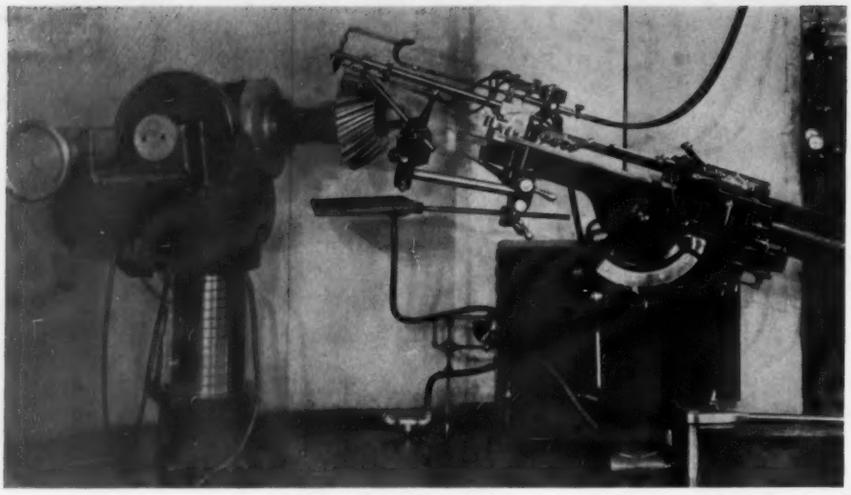
These brick have long played an important part in industries that work with high temperatures. Armstrong's Brick help to conserve fuel, to raise operating efficiency, and to promote accurate temperature control. In intermittent furnaces, they speed the operating cycle because their low heat capacity makes it possible to bring furnaces to the required temperature faster. In construction, too, Armstrong's Brick save money. They are accurately sized, light in weight, and have high crushing strength.

Let us send you detailed information about the complete line of Armstrong's High Temperature Insulation. Write for samples, prices, and literature to Armstrong Cork Company, Building Materials Division, 985 Concord St., Lancaster, Pa.

Armstrong's

HIGH TEMPERATURE INSULATION

COPRTEX BLOCK
INSULATING FIRE BRICK
REFRACTORY CEMENTS
DIATOMACEOUS EARTHS



Machine easily handles gears of complicated tooth design in a wide variety of types and sizes

gears are hardened, the burner tips may be too small to permit use of waterjackets, in which case they are omitted. Water lines for quenching teeth and for cooling main body of the gear blank are especially useful where gears of relatively thin sections are being hardened. Except for burners of special design, all gas regulating and mixing equipment is standard.

Hardening Is Done Automatically

Motion of burners is obtained by use of a hydraulic cylinder connected to a hydraulic power unit. A variable rate of travel of the slide is provided. This affords a suitable speed to start the hardening of the teeth at the ends, also it permits use of a variable speed to give the correct heating rate over the entire length of the teeth. In addition, a speed-up is provided over the ends of the teeth as forward stroke terminates.

This permits the hardening operation to be done automatically. It is only necessary for the operator to index the gear from tooth to tooth. A hardened finger on the end of a lever is connected to the burner head and is adjustable to fit in the tooth slot. This finger holds the gear motionless while the hardening is progressing. At the end of the hardening stroke, the operator lifts the finger and moves the gear to bring the proper slot under the finger. Travel of the burner slide is reversed. As burners make the return stroke, the tooth to be hardened is preheated. At end of the return stroke, the slide automatically reverses and again starts the hardening stroke.

Cams Guide Burners

Cams guide the direction of travel of the burners. For straight bevel gears and for spiral bevel and hypoid gears which have been cut by the planing-generating method where tooth curvature is slight, the cams are of the straight-line type. They are adjusted angularly to provide the correct path of travel. Bevel gears with comparatively greater tooth curvature utilize curved came in their treatment. The machine setup is facilitated greatly by a gage similar to a stock-dividing gage on a gear cutting machine. Operator inserts the gage finger in its holder on the burner column unit and adjusts burner column so gage finger rests across face of the gear in correct location on top of a tooth. Adjustable components of the machine are graduated so a record of settings may be kept, thus reducing setup time on repeat jobs. These universal machines can be used to flame harden teeth of straight bevel, spiral bevel, hypoid, spur, helical and internal gears.

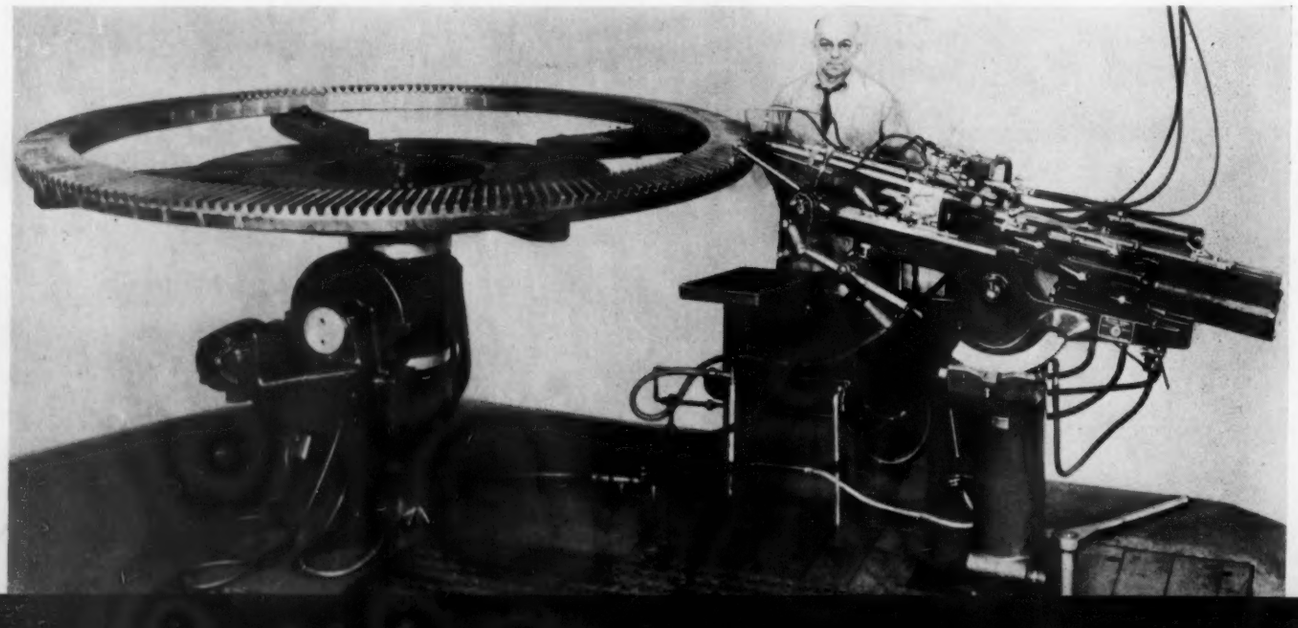
Preliminary Heat Treatment

Proper selection and preliminary heat treatment of materials is a fundamentally important consideration often overlooked or disregarded in manufacture of flame-hardened gears. While many types of steel forgings can be flame hardened successfully, SAE 4640 and 6145 are recommended. These are usually readily obtainable, comparatively inexpensive and produce uniformly dependable results. A lower priced steel SAE X1340 also is rapidly coming into use, particularly for certain machine tool gears where tooth loads do not necessitate maximum possible surface hardness. Other steels, of course, can be used successfully.

Standard practice at Gleason using steel forgings is to specify a preliminary heat treatment, namely normalize, preheat, quench and draw to the required hardness to establish the necessary core strength before the blanks are processed since flame hardening has no effect on the core. Core hardness required varies from 235 to 302 brinell according to stresses to which the gears are to be subjected in service. Where tooth loads are extremely high, a core hardness of 302 to 341 brinell ened should have 1 to 1.5 per cent may be specified.

Preferred practice is to purchase

(*Please turn to Page* 111)



Machine is capable of hardening gears up to 120 inches pitch diameter and 16 inches face width

Thirty-Fifth

Annual Convention and

Exposition, Association of

IRON & STEEL ENGINEERS

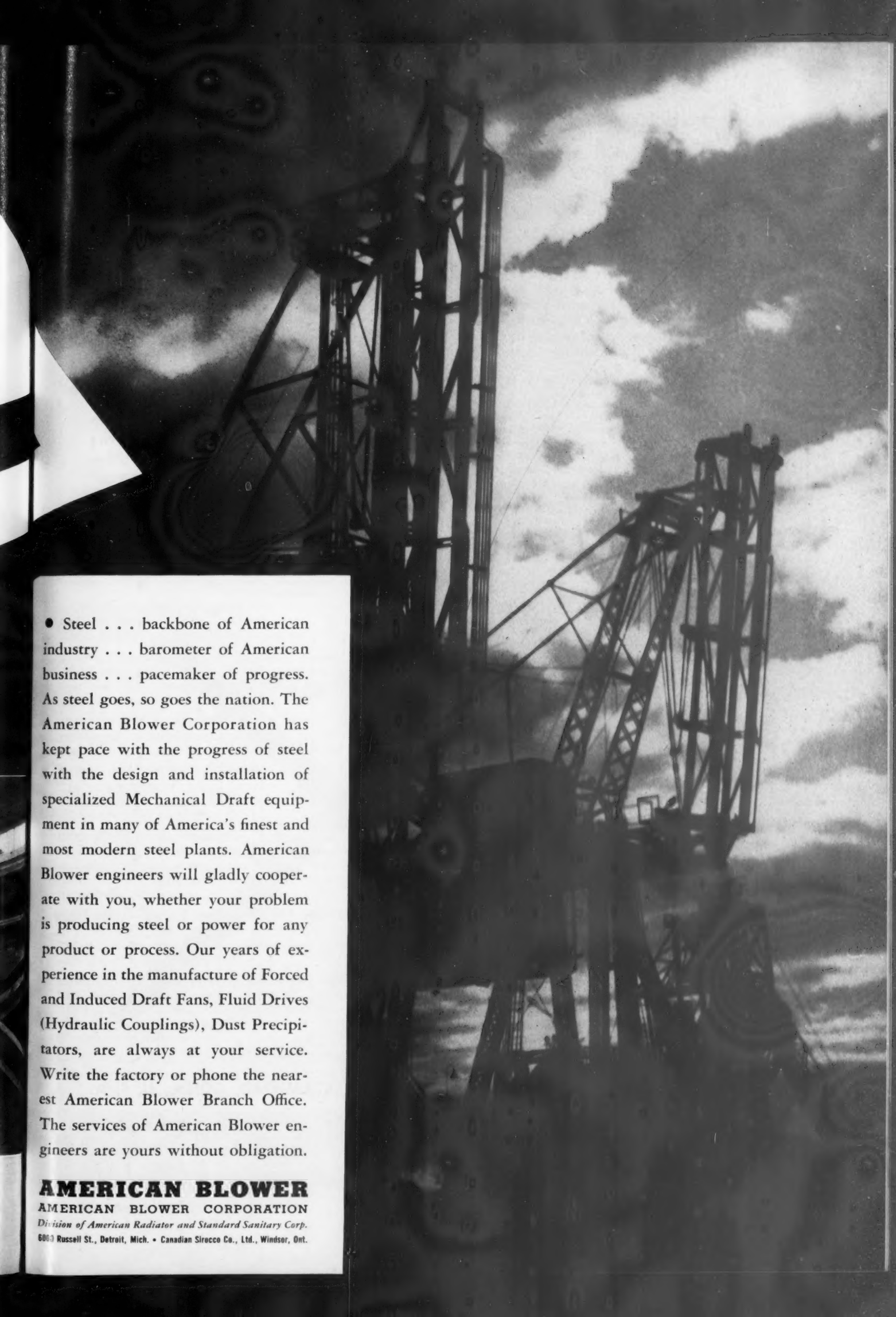
Wm. Penn Hotel

Pittsburgh Sept. 26-29, 1939

PROGRESS IN STEEL

Three pairs of Sirocco Induced Draft Fans operating in parallel (2 fans per boiler) in a large steel mill power plant. A.H.S. Forced Draft Fans also serve this plant.

One of 8 pairs of Sirocco Induced Draft Fans for parallel operation (2 fans per boiler) in another leading steel mill. Sirocco Forced Draft Fans are also used at this plant.



• Steel . . . backbone of American industry . . . barometer of American business . . . pacemaker of progress. As steel goes, so goes the nation. The American Blower Corporation has kept pace with the progress of steel with the design and installation of specialized Mechanical Draft equipment in many of America's finest and most modern steel plants. American Blower engineers will gladly cooperate with you, whether your problem is producing steel or power for any product or process. Our years of experience in the manufacture of Forced and Induced Draft Fans, Fluid Drives (Hydraulic Couplings), Dust Precipitators, are always at your service. Write the factory or phone the nearest American Blower Branch Office. The services of American Blower engineers are yours without obligation.

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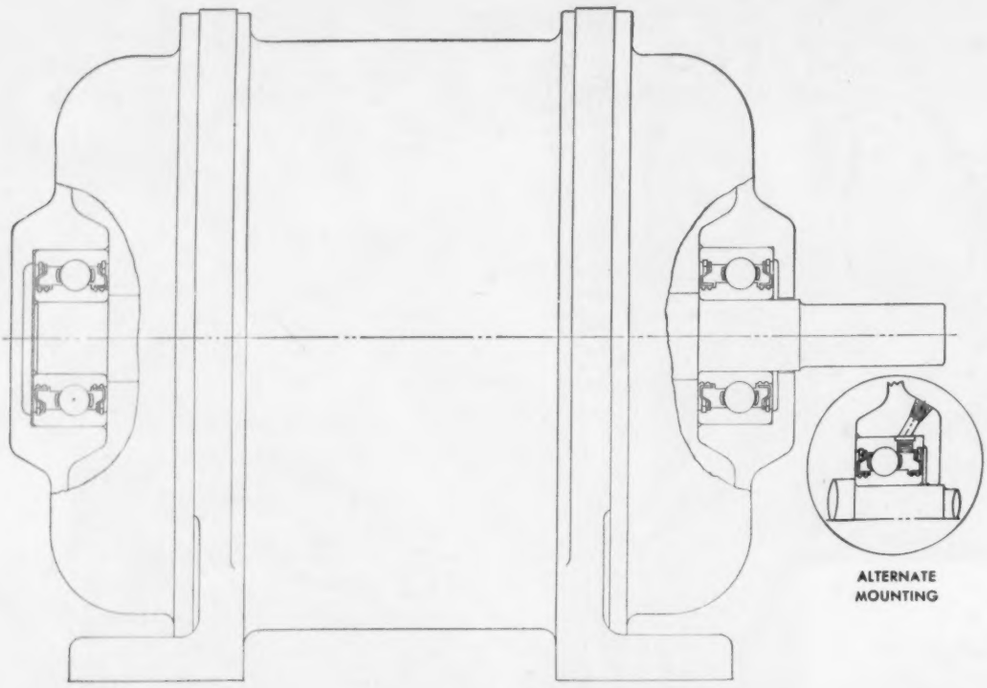
MODERNIZE THE BEARINGS IN



THE IMPROVED

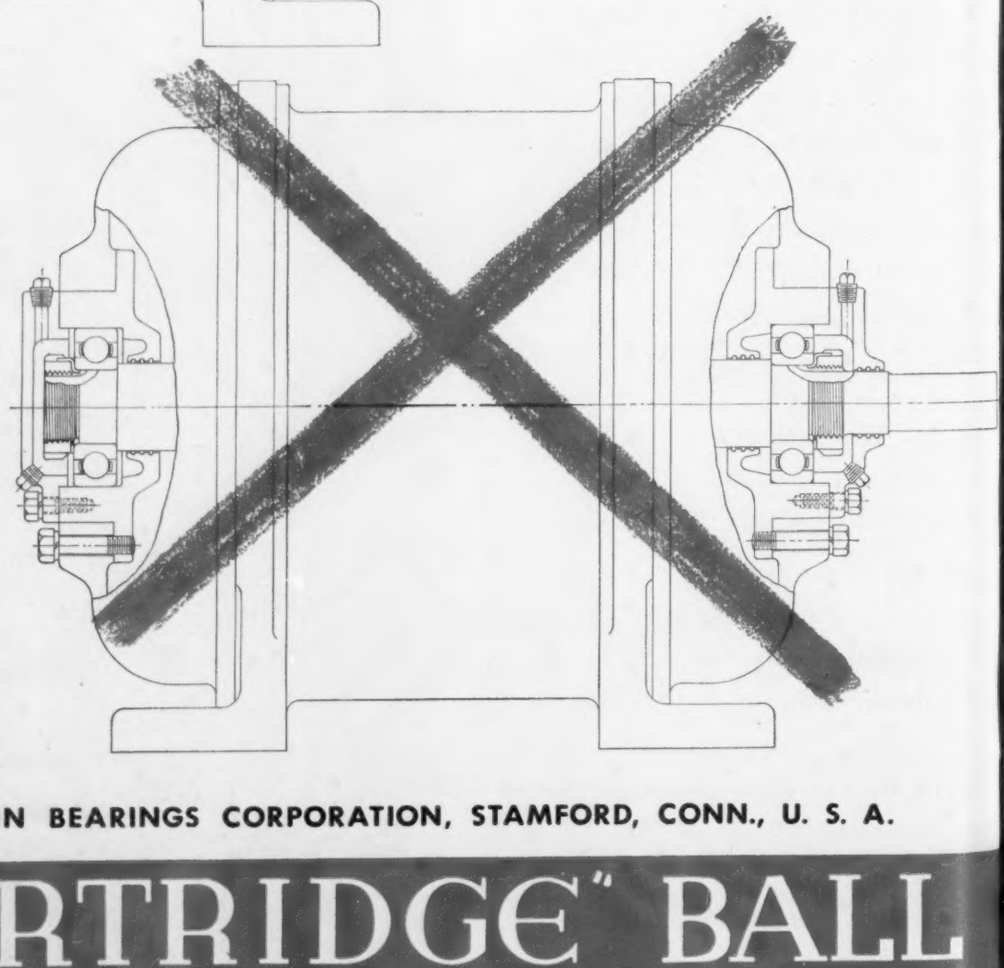
A Part Section of an Improved Motor Mounting with Ultra-Modern "CARTRIDGE" BALL BEARINGS.

THE PRESENT

A Part Section of a Typical Present-Day Motor with Unshielded Ball Bearings in the Conventional Cartridge Type Mounting.

•

See opposite page for machining operations and parts eliminated from this motor.



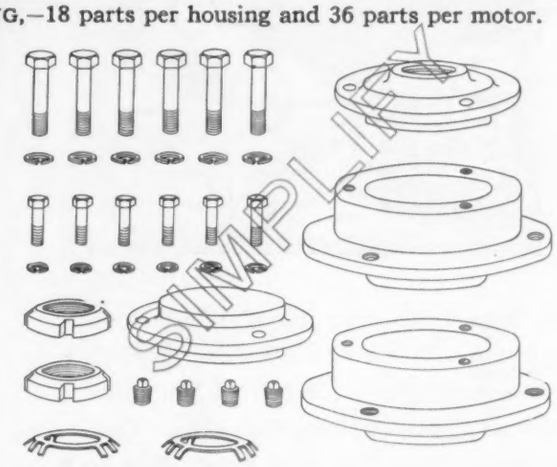
NORMA-HOFFMANN BEARINGS CORPORATION, STAMFORD, CONN., U. S. A.

USE "CARTRIDGE" BALL

YOUR MOTORS!

36 (OR MORE) PARTS ELIMINATED

Below are shown the extra parts required in the conventional cartridge type mounting. THESE ARE ALL ELIMINATED BY USING THE "CARTRIDGE" BALL BEARING,—18 parts per housing and 36 parts per motor.



30 (OR MORE) MACHINING OPERATIONS SAVED

Mounting the "CARTRIDGE" BALL BEARING in the motor housing requires only (1) Boring motor end housing for bearing, (2) Facing housing bore for bearing abutment—4 machining operations per motor.

The conventional cartridge mounting employing the unshielded ball bearing requires 30 additional machining operations per motor.

MACHINING OPERATIONS ELIMINATED

1. Drilling Motor Housing for cap screws.
2. Machining Outer Diameter of Cartridge.
3. Facing Cartridge Flange.
4. Boring Cartridge for Bearing.
5. Facing Cartridge for Cover Plate.
6. Facing Cartridge Bore for Bearing Abutment.
7. Boring Cartridge for Shaft Clearance.
8. Drilling and Tapping Cartridge for Cap Screws.
9. Machining Flange of Cover Plate.
10. Facing Cover Plate.
11. Boring Cover Plate for Shaft Clearance.
12. Drilling Cap Screw Holes.
13. Drilling and Tapping for Grease Fittings and Drain Plugs.
14. Threading Shaft for Lock Nut.
15. Cutting Keyway on Shaft for Lock Washer.

Developed expressly to improve electric motor design and performance, the "ultra-modern" "CARTRIDGE" BALL BEARING offers the following advantages:

SIMPLIFIED DESIGN: As indicated above, eliminates 36 or more parts,—each an inventory burden and potential trouble-maker. Shortens overall length of mounting and reduces overhang of shaft.

ECONOMICAL MOUNTING: Cuts out the many costly machining operations enumerated above. Assures better bearing alignment because of fewer possible variables.

EASIER AND FASTER ASSEMBLY AND DISASSEMBLY: The "CARTRIDGE" BALL BEARING is handled as an integrally sealed, single unit unencumbered by numerous complementary parts.

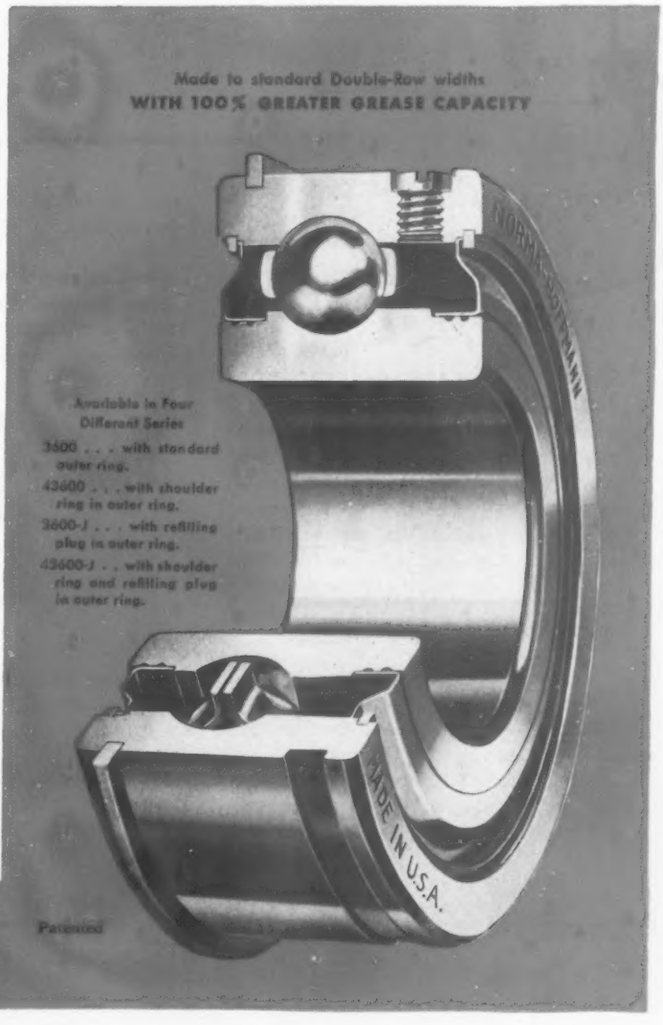
DIRT HAZARD ELIMINATED: Tightly-fitted seals prevent ingress of foreign matter during assembly, in service and when removing armature. The "CARTRIDGE" BALL BEARING comes pre-packed with clean, "stability-tested," uncontaminated grease.

SLIPPAGE, PEENING AND COCKING PREVENTED due to wider race contact area on shaft and in housing. No locking means required and elimination of threading permits use of stronger shafts.

LONGER LIFE AND LOWER MAINTENANCE, resulting from large, lasting grease supply kept in close proximity to rotating surfaces by highly efficient, wearless metal seals. No "dead" grease space and no leakage irrespective of position of motor.

REGREASING AND INSPECTION FACILITATED, refilling plug and removable seals being provided for such purposes.

Let our engineers work with yours. Write for the Catalog.

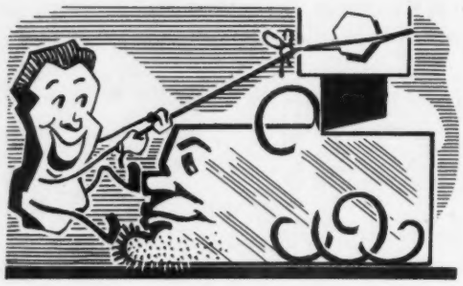

Made to standard Double-Row widths
WITH 100% GREATER GREASE CAPACITY
Available in Four Different Series
3600 . . . with standard outer ring.
43600 . . . with shoulder ring in outer ring.
3600-J . . . with refilling plug in outer ring.
43600-J . . . with shoulder ring and refilling plug in outer ring.
NORMA-HOFFMANN
MADE IN U.S.A.
Patented

BEARINGS

How 12 to 15% Zirconium Alloy Improves Toughness and Machinability of Steel

WHEN USED as a final addition to killed steel, 12 to 15 per cent zirconium alloy is a powerful deoxidizer with a definite and uniform effect. Zirconium combines readily with oxygen and nitrogen and permits close control of grain size. Objectionable inclusions are reduced and those that remain are small, scattered, and less harmful. The result is a cleaner and more uniform steel with improved toughness and machinability. Zirconium also improves the impact value of high-phosphorous steels and minimizes the detrimental effect of sulphur.

Ask to have one of our metallurgists call and explain further how you can use 12 to 15 per cent zirconium alloy to advantage. He



can help make your use of this and other "Electromet" ferro-alloys more profitable, without obligation. Electro Metallurgical Company, Unit of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York, N. Y. In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ont.

Items of Interest about other "Electromet" Ferro-Alloys

Silico-Manganese Improves Low-Carbon Steel— Excess dissolved oxides in the lower-carbon grades of rimming steel for deep drawing purposes may be eliminated through the careful use of small amounts of silico-manganese. This simple operation of washing the steel before tapping results in better rolling qualities and greater freedom from objectionable inclusions.

Calcium-Silicon Makes Clean Steel— Calcium-silicon used in the ladle is an excellent scavenger for steel. Both elements of this alloy are active deoxidizers, forming a fluid, low-melting slag which readily escapes from the metal. A clean, free-flowing steel results.

Low-Carbon Ferrochrome Produces Better Chromium Steel— The lower carbon content of low-carbon ferrochrome as compared with

high-carbon ferrochrome inhibits the formation and segregation of hard chromium carbide areas in chromium steel. A more uniform steel results.

Low-Carbon Alloys Save Time and Money — Low-carbon alloys, such as low-carbon ferrochrome and ferromanganese, offer a number of advantages over the higher carbon grades. Oxidation of the bath need not be so severe. The metal loss is decreased. Refractory costs are lowered. Valuable minutes of furnace time are saved. Furnace production is increased. Recovery of the alloying elements is appreciably higher.

• • •

If you want more information about these and the many other "Electromet" ferro-alloys and metals and the service that goes with their purchase, write for the booklet, "Electromet Products and Service."

Electromet
Trade-Mark
Ferro-Alloys & Metals

The word "Electromet" is a registered trademark of Electro Metallurgical Company

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ASSOCIATION OF IRON AND STEEL ENGINEERS

(ORGANIZED 1907 AS ASSOCIATION OF IRON AND STEEL ELECTRICAL ENGINEERS)

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Empire Bldg., Pittsburgh

TO READERS OF STEEL:

There is no better method for solving a mutual problem than by mutual cooperation. The problems which beset the iron and steel industry may vary slightly with local conditions, but basically they are the same, all involving the fundamental problem of maximum production of highest quality at lowest cost.

The Association of Iron and Steel Engineers has as its object the advancement of engineering in the iron and steel industry by the cooperation of its members. To promote this object, the Association presents its Annual Convention, embracing the Iron and Steel Exposition, a technical program of unusual interest, and Inspection Trips. These activities provide an excellent opportunity for the investigation and discussion of the mutual problems of the steel plants.

I am looking forward to the pleasure of greeting our friends in the iron and steel industry at the 35th Annual Convention of the Association, in Pittsburgh, Pennsylvania, at the William Penn Hotel, September 26, 27, 28 and 29.

Yours very truly,

C. Clarke Wales

C. Clarke Wales
President
A. I. & S. E.

CCW:dmh

A.I.S.E. Invites You

C. C. WALES
President, A.I.S.E.

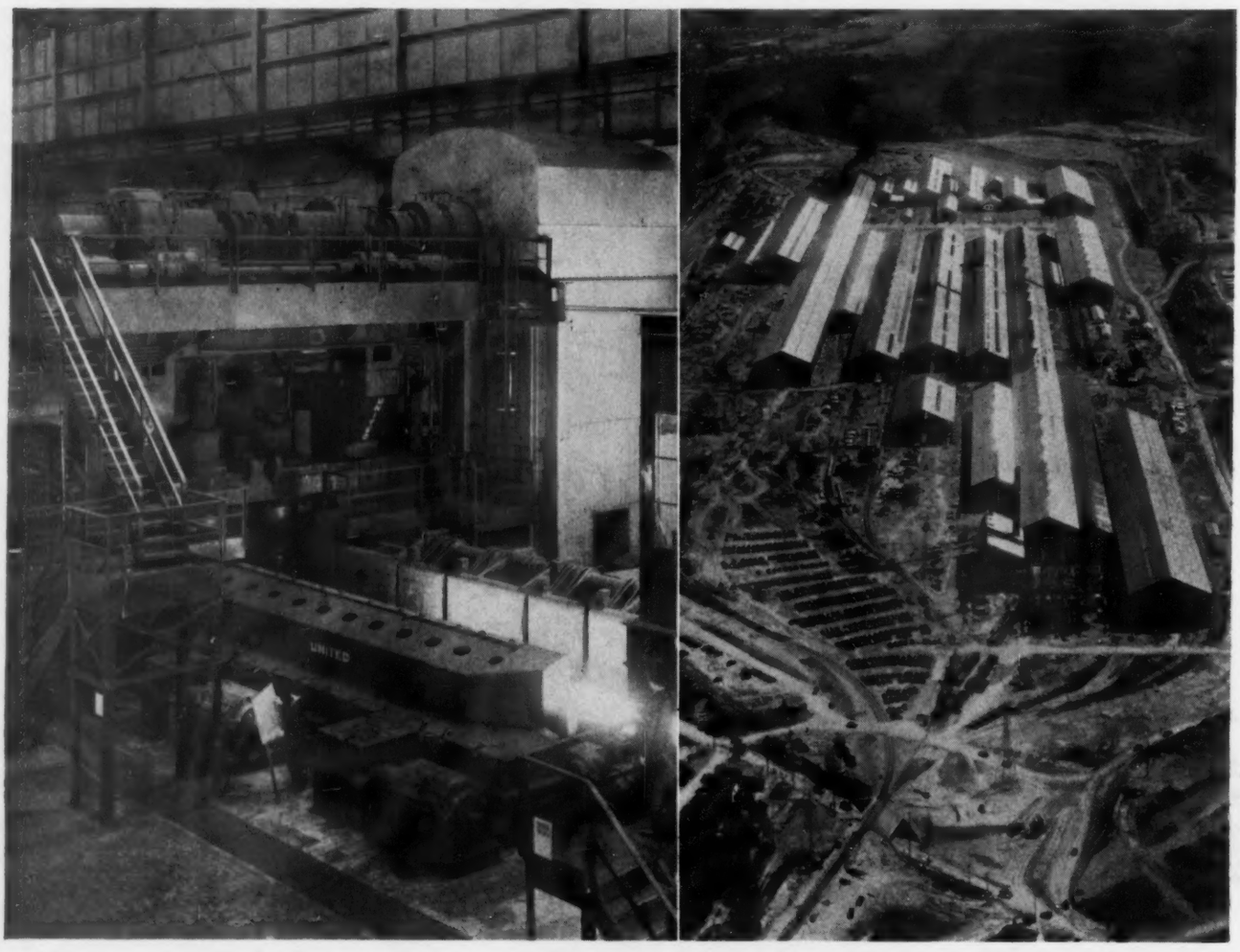
J. A. CLAUSS
1st Vice President, A.I.S.E.

J. L. MILLER
Secretary, A.I.S.E.

F. E. FLYNN
Treasurer, A.I.S.E

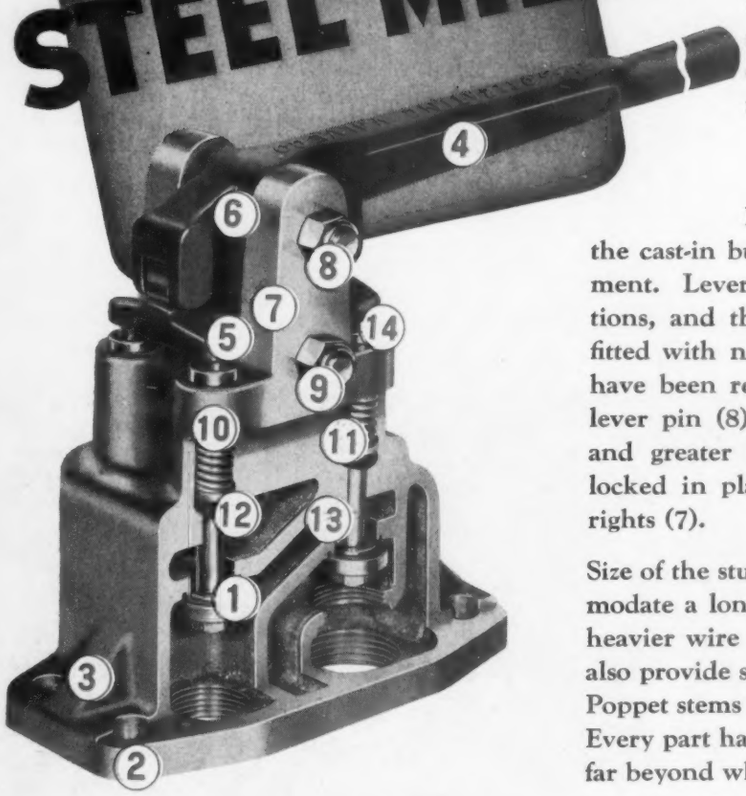
Open House

Irvin and Edgar Thomson works of Carnegie-Illinois Steel Corp. will be hosts to visitors attending the inspection trips and open house, features of this year's convention.



Left, Edgar Thomson's big slabbing mill. Right, Irvin works, the "Mill on the Hill"

New HEAVY DUTY Air Valve FOR USE IN STEEL MILLS



THE VERY first Ross Valve built was especially designed for Steel Mill operations. Many of these old model 5P valves, installed 14 and 15 years ago, are still in service.

Spring mechanism was materially improved through changes made in our model 4P valve introduced in 1929. The present oil-resistant, synthetic rubber valve seat (see 1) was adopted in 1936, and this together with the line pressure application, results in a positive non-leaking air seal.

A Heavier, Sturdier Valve

Ever bent on making a good product better and appreciating the importance of dependable valves in Steel Mill operations, Ross now offers a new valve, one that retains all the proven principles of the original Ross valve, but is built sturdier in every detail, a valve that is especially designed for use in Steel Mills and plants where operations require heavy duty equipment to meet extraordinary demands.

Check These Improvements

Mounting flange (2) is much heavier and the cast-in buttress (3) of solid metal, provides reinforcement. Lever (4) is a steel casting of over-size proportions, and this as well as the forged steel rocker (5) is fitted with needle type roller bearings (6). Uprights (7) have been redesigned to provide space for special alloy lever pin (8) and rocker pin (9) of increased diameter and greater bearing surface. These pins are securely locked in place to prevent any possible wear in the uprights (7).

Size of the stuffing boxes (10) has been increased to accommodate a longer and larger diameter spring (11) made of heavier wire with more coils. These larger stuffing boxes also provide space for a generous amount of packing (12). Poppet stems (13) and retainers (14) are of stainless steel. Every part has been designed for extra strength and wear, far beyond what would seem necessary.

New Valve Fits Old Mountings

To replace your old Ross Valves with this new Ross Heavy Duty type is a simple matter—mounting dimensions, pipe connection locations and bolt holes remain the same.

There is a Ross representative located near you—write, wire or telephone for information and service.

ROSS Air Control VALVES

THE BRIDLE FOR AIR HORSEPOWER

ROSS Operating VALVE COMPANY

6474 Epworth Boulevard, DETROIT, MICHIGAN

★ A SIZE AND TYPE FOR EVERY OPERATION FOR HAND, FOOT, MECHANICAL AND ELECTRICAL CONTROL ★

Pittsburgh Greets Iron and Steel Engineers

■ EYES and ears of the Steel industry will be trained on Pittsburgh during the Iron and Steel Exposition, Sept. 26-29, 1939. This year probably more than in previous years, steel management stands behind the engineers themselves, listening in—eavesdropping on the new developments as well as the opinions and thinking of the industry's technicians.

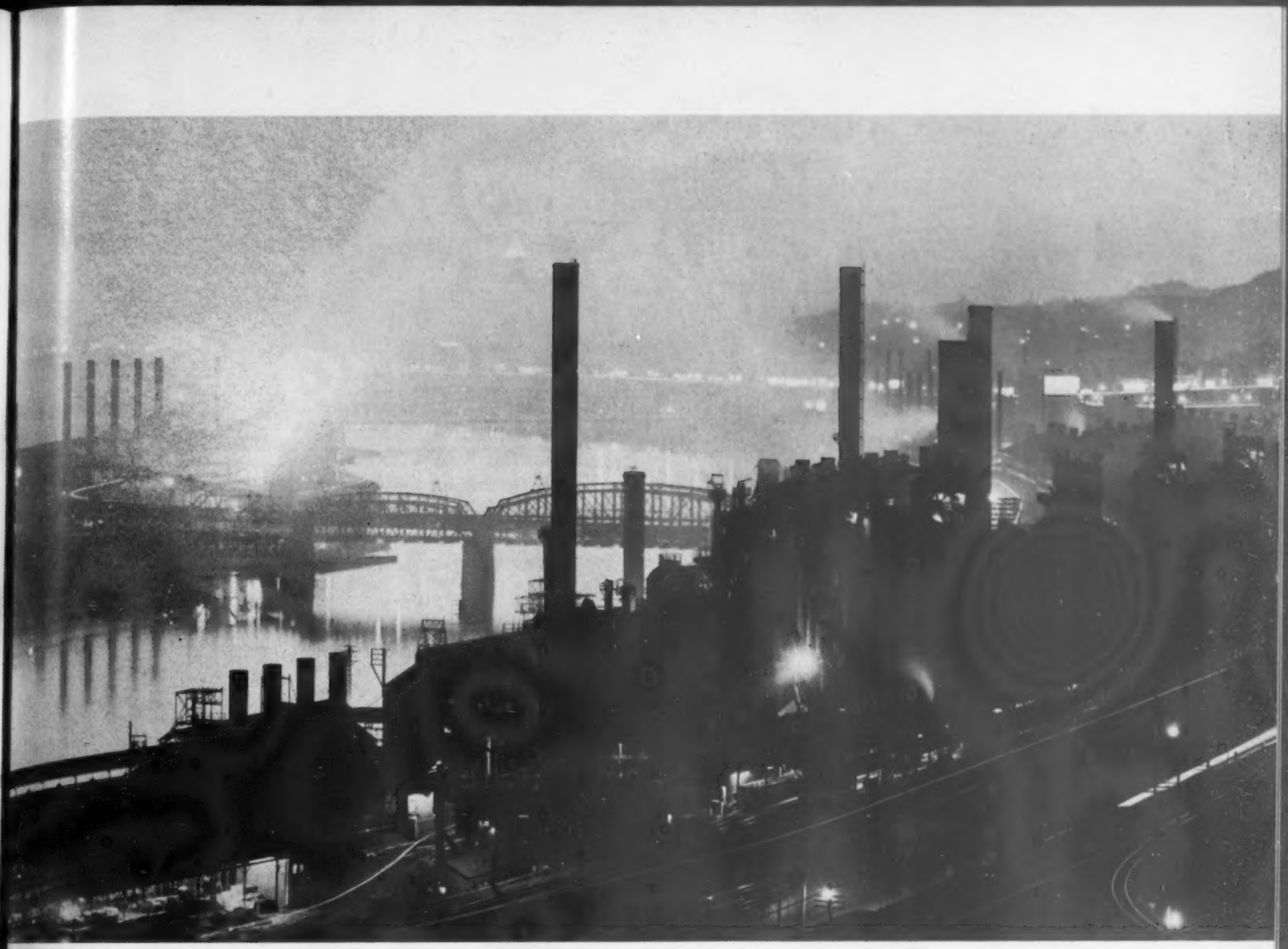
For this year is unlike any other year; it is one of uncertain future and even of uncertain present. Now, more than ever before, technology is playing a powerful hand in steel developments, because not only does it create economic problems through obsolescence, but also it affects mightily the social factor, which under our present government and for an indefinite period is to play an unpredictably large part in steel production, steel distribution and in new steel applications.

There is no more common ground on which to meet and to see in everyday occurrence the concrete problems of the industry than in Pittsburgh.

It was 150 years ago this year that the iron and steel industry had its humble beginnings west of the Alleghenies. In 1789 the old Alliance furnace, around which have sprung up numbers of legends, was built by Peter Marmie and William Turnbull on Jacobs creek, near the Youghiogheny river in Fayette county.

This pioneer furnace, together with its ore banks, brickworks and land, was sold at the height of its prosperity for approximately $10,000; while today the value of metalworking industry in Allegheny county alone is estimated at $658,413,300.

Ever since the beginning of the industry in western Pennsylvania a century and half ago, Pittsburgh has been a steel center. For the past century the name of Pittsburgh has been synonymous with steel, and



Left, Pittsburgh's Golden Triangle as seen from the approximate north. Above, river views such as this meet the visitor at many points. Just at dusk, with the red of furnaces tinting the sky, the river and huge plants form a most intriguing sight and one not found in many other parts of the country

today the center of America's greatest industry is in the valleys of a half dozen rivers, within a 50-mile radius of the Golden Triangle, Pittsburghs' famous business center.

Many of the industry's milestones are indicated by events which have occurred here. Famous names of steel have been linked with Pittsburgh, including Carnegie, Phipps, Oliver, Snyder and Captain W. R. "Bill" Jones, paragon of operating men, whose tonnage records stood for decades.

Manufacture of every iron and steel product is carried on in plants of this district. From the largest steel ingots ever poured, giants weighing half a million pounds and eight feet in diameter, down to stainless steel tubing so small as to be hardly recognizable by the naked eye, Pittsburgh mills are producing daily a complete range of products.

Not alone are the steel products themselves made here. The mills on which they are produced are also products of Pittsburgh industries. All types of equipment used in iron and steel production are made here, from the blast furnace and coke oven to the levellers and straighteners which mark the finished steel. A major part of the nation's rolling mill equipment could well be stamped "Made in Pittsburgh," as could be a sizable fraction of the annealing furnaces, soaking pits, shears, picklers, coilers and other equipment. Some of the best examples of modern mill equipment have been made here and installed in local plants. The rolls themselves are products of Pittsburgh, since in this area are located a large number of the roll producers of the country.

Too, in Pittsburgh plants can be found the latest developments in technology. All that is new in mill technique, in machine design, in materials handling is here to be seen—and is being seen, as most district plants are open and visitors are invited to inspect their facilities.

In the Pittsburgh area can be found plants which are the acme of efficiency, plants where safety is more than a by-word—where it has become a part of production procedure. There are mills here where the industrial relations job has been so well done that a visitor senses the spirit when he enters the plant for the first time.

Aside from the problems which have been worked out in Pittsburgh mills are the deeper problems in research which are constantly emerging from Pittsburgh laboratories. Example of every type of research can be found in steel company laboratories themselves, in private laboratories or in the famous Mellon Institute of Industrial Research. In addition to research and development, Pittsburgh steel mill laboratories are excellent examples of how the fruits of research are tied in directly with actual steelmaking practice, improving the quality of the product.

Besides the actual making of steel, production of the industry's policies is centered in Pittsburgh. More than half the management of the industry is located here, representing over 55 per cent of the national ingot capacity, vested in nearly 50 separate corporations.

Power Savings buy New Drive

Gearmotor on drawbench equipment cuts power costs 10.5% — repays cost in less than 4 years; quietness, space saving, safety are plus values.

Reducing percentages to dollars and cents, the Michigan Seamless Tube Company is saving $28.77 per month on one drawbench, by operating with Westinghouse gearmotor and speed reducer, instead of open gearing. This saving will pay for the new drive in less than four years.

And there are other advantages. The new drive is more dependable. Absence of splashing lubrication removes hazards of slippery floors. 45% savings in floor space — new installation requires only 63 sq. ft. instead of 116 sq. ft., formerly used. Quiet operation improves working conditions.

Showing industry how to save and make money by matching electric drives to the job to be done is everyday work with Westinghouse engineers. They're ready to help you with your problems. Ask our local office, or write Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa. Address Dept. 7-N.

J-90231

Drawbenches modernized with Westinghouse Gearmotor and Speed Reducer Drives (above) as contrasted with old method (right). Note improved appearance, cleanliness, safety — all of which are extra dividends above and beyond the moneysaving features of these new drives.

Westinghouse

W
WESTINGHOUSE ELECTRIC

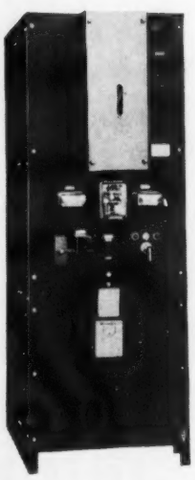
MODERN EQUIPMENT PAYS FOR ITSELF

REPAY COST IN POWER FACTOR CORRECTION

SYNCHRONOUS MOTORS

More work per dollar — low first cost of Westinghouse synchronous motors soon returned from savings in power due to better power factor — and reduced maintenance costs. Westinghouse "definite time" starting makes them easy to start — protects starting windings.

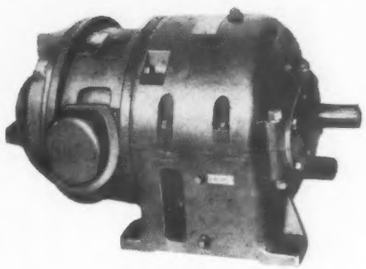
★ ★ ★



CAPACITORS

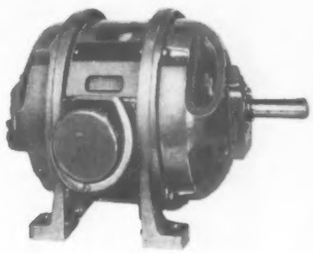
Reduce power bills—by improved power factor, with Westinghouse Capacitors. Cuts amount of current on line between capacitor and power source. Reduces line drop, effects better line regulation. Lessens circuit and transformer losses.

BIGGER DIVIDENDS FROM REDUCED OPERATING COSTS



GEARMOTORS

High speed efficiency for slow speed machines — exact horsepower needed at required rpm of driven machine. Westinghouse Gearmotors simplify installation, banish maintenance of belts, pulleys, sprockets and chains. Deliver 96% to 98% of motor's output.



GENERAL PURPOSE MOTORS

Extra features at no extra cost — added mechanical strength of rigid one-piece frames. More electrical strength with Tuffernell insulation, and bearings, either ball or sleeve, that are free from lubrication grief.

NOFUZE PANELBOARDS

Oil - immersed, corrosion - resisting and fuseless — panelboards that save their costs by reducing current outages. Have *new* bi-metal compensator that holds fixed calibration regardless of heat or cold.

COMBINATION LINESTARTERS

Simplify control installation — save space, labor, and conduit with Westinghouse Combination Linestarters. Sheet metal enclosure combines all needed devices in motor circuit in one unit — saves first cost and operating cost.

Motors and Control

THE PITTSBURGH DISTRICT—STEEL'S CAPITAL

At locations shown on this map are steelmaking facilities which represent approximately 27 per cent of the country's total ingot capacity

Listing By Companies

1. Allegheny Ludlum Steel Corp., Brackenridge, Pa.; West Leechburg, Pa.
2. American Bridge Co., Ambridge, Pa.; Pittsburgh.
3. American Chain & Cable Co. Inc., Page division, Monessen, Pa.; Braddock, Pa.
4. American Locomotive Works, Latrobe, Pa.
5. American Rolling Mill Co., Butler, Pa.
6. American Steel & Wire Co., Donora, Pa.; Rankin, Pa.
7. Anchor Drawn Steel Co., Latrobe, Pa.
8. Apollo Steel Co., Apollo, Pa.
9. Babcock & Wilcox Tube Co., Beaver Falls, Pa.
10. Bethlehem Steel Corp.. Leetsdale, Rankin and Carnegie, Pa.
11. Braeburn Alloy Steel Corp., Braeburn, Pa.
12. A. M. Byers Co., Ambridge, Pa.; Pittsburgh.
13. Carnegie-Illinois Steel Corp., Rankin, Pa.; Clairton, Pa.; Duquesne, Pa.; Braddock, Pa.; Homestead works, Munhall, Pa.; Howard axle works, W. Homestead, Pa.; Etna, Pa.; McKees Rocks, Pa.; Monessen, Pa.; Vandergrift, Pa.; McKeesport, Pa.; Mingo Junction, O.; Dravosburg, Pa.
14. Central Tube Co., Ambridge, Pa.
15. Colonial Steel Co., Colona, Pa.
16. Columbia Steel & Shafting Co., Carnegie, Pa.
17. Copperweld Steel Co., Glassport, Pa.
18. Crucible Steel Co. of America, McKees Rocks, Pa.; LaBelle works, Pittsburgh; Park works, Pittsburgh.
19. Edgewater Steel Co., Oakmont, Pa.
20. Ellwood Steel Corp., Ellwood City, Pa.
26. Jones & Laughlin Steel Corp., Aliquippa, Pa.; Pittsburgh.
27. Kidd Drawn Steel Co., Aliquippa, Pa.
28. Latrobe Electric Steel Co., Latrobe, Pa.
29. Lockhart Iron & Steel Co., McKees Rocks, Pa.
30. McKeesport Tin Plate Corp., McKeesport, Pa.
31. Moltrup Steel Products Co., Beaver Falls, Pa.
32. Molybdenum Corp., Washington, Pa.
33. National Supply Co., Ambridge, Pa.; Etna, Pa.
34. National Tube Co., McKeesport, Pa.; Ellwood City, Pa.
35. Pittsburgh Coke & Iron Co., Neville Island, Pa.
36. Pittsburgh Crucible Steel Co., Midland, Pa.
37. Pittsburgh Steel Co., Monessen, Pa.; Allenport, Pa. (Not on map).
38. Pittsburgh Tool Steel Wire Co., Monaca, Pa.
39. Pittsburgh Tube Co., Monaca, Pa.
40. Republic Steel Corp., Pittsburgh, Beaver Falls, Pa. (Dilworth Porter, Truscon, Union Drawn divisions).
41. Standard Tin Plate Co., Canonsburg, Pa.
42. Superior Steel Corp., Carnegie, Pa.
43. Superior Steel Products Co., Monaco, Pa.
44. Townsend Co., New Brighton, Pa.
45. Union Electric Steel Corp., Carnegie, Pa.
46. Universal-Cyclops Steel Corp., Bridgeville, Pa.
47. Vanadium-Alloys Steel Co., Latrobe, Pa.
48. Vulcan Crucible Steel Co., Aliquippa, Pa.

Listing By Locations

Aliquippa, Pa.
- Jones & Laughlin Steel Corp.
- Kidd Drawn Steel Co.
- Vulcan Crucible Steel Co.

Ambridge, Pa.
- American Bridge Co.
- A. M. Byers Co.
- Central Tube Co.
- National Supply Co.
- Wyckoff Drawn Steel Co.

Apollo, Pa.
- Apollo Steel Co.

Beaver Falls, Pa.
- Babcock & Wilcox Tube Co.
- Moltrup Steel Corp.
- Republic Steel Corp. (Dilworth Porter, Truscon, Union Drawn Divisions)

Brackenridge, Pa.
- Allegheny Ludlum Steel Corp.

Braddock, Pa.
- American Chain & Cable Co. Inc.
- Carnegie-Illinois Steel Corp.

Braeburn, Pa.
- Braeburn Alloy Steel Corp.

Bridgeville, Pa.
- Universal-Cyclops Steel Corp.

Butler, Pa.
- American Rolling Mill Co.

Canonsburg, Pa.
- Standard Tin Plate Co.

Carnegie, Pa.
- Bethlehem Steel Corp.
- Columbia Steel & Shafting Co.
- Superior Steel Corp.
- Union Electric Steel Corp.

Clairton, Pa.
- Carnegie-Illinois Steel Corp.

Colona, Pa.
- Colonial Steel Co.

Donora, Pa.
- American Steel & Wire Co.

Dravosburg, Pa.
- Carnegie-Illinois Steel Corp.

Duquesne, Pa.
- Carnegie-Illinois Steel Corp.

East Butler, Pa.
- Fretz-Moon Tube Co.

Ellwood City, Pa.
- Ellwood Steel Corp.
- National Tube Co.

Etna, Pa.
- Carnegie-Illinois Steel Corp.
- National Supply Co.

McKeesport, Pa.
- Carnegie-Illinois Steel Corp.
- Firth-Sterling Steel Co.
- McKeesport Tin Plate Corp.
- National Tube Co.

McKees Rocks, Pa.
- Carnegie-Illinois Steel Corp.
- Crucible Steel Co. of America
- Lockhart Iron & Steel Co.

Midland, Pa.
- Pittsburgh Crucible Steel Co.

Mingo Junction, O.
- Carnegie-Illinois Steel Corp.

Monaca, Pa.
- Pittsburgh Tool Steel Wire Co.
- Pittsburgh Tube Co.
- Superior Steel Products Co.

Monessen, Pa.
- American Chain & Cable Co. Inc.—Page Div.
- Carnegie-Illinois Steel Corp.
- Pittsburgh Steel Co.

Munhall, Pa.
- Carnegie-Illinois Steel Corp.

Neville Island, Pa.
- Pittsburgh Coke & Iron Co.

New Brighton, Pa.
- Townsend Co.

Oakmont, Pa.
- Edgewater Steel Co.

Pittsburgh, Pa.
- American Bridge Co.
- A. M. Byers Co.
- Crucible Steel Co. of America—LaBelle Works
- Crucible Steel Co. of America—Park Works
- Heppenstall Co.
- Jones & Laughlin Steel Corp.
- Republic Steel Corp.

Rankin, Pa.
- American Steel & Wire Co.
- Bethlehem Steel Corp.
- Carnegie-Illinois Steel Corp.

Steubenville, O.
- Weirton Steel Co.
- Wheeling Steel Co.

Toronto, O.
- Follansbee Bros. Co.

Vandergrift, Pa.
- Carnegie-Illinois Steel Corp.

Washington, Pa.
- Jessop Steel Co.

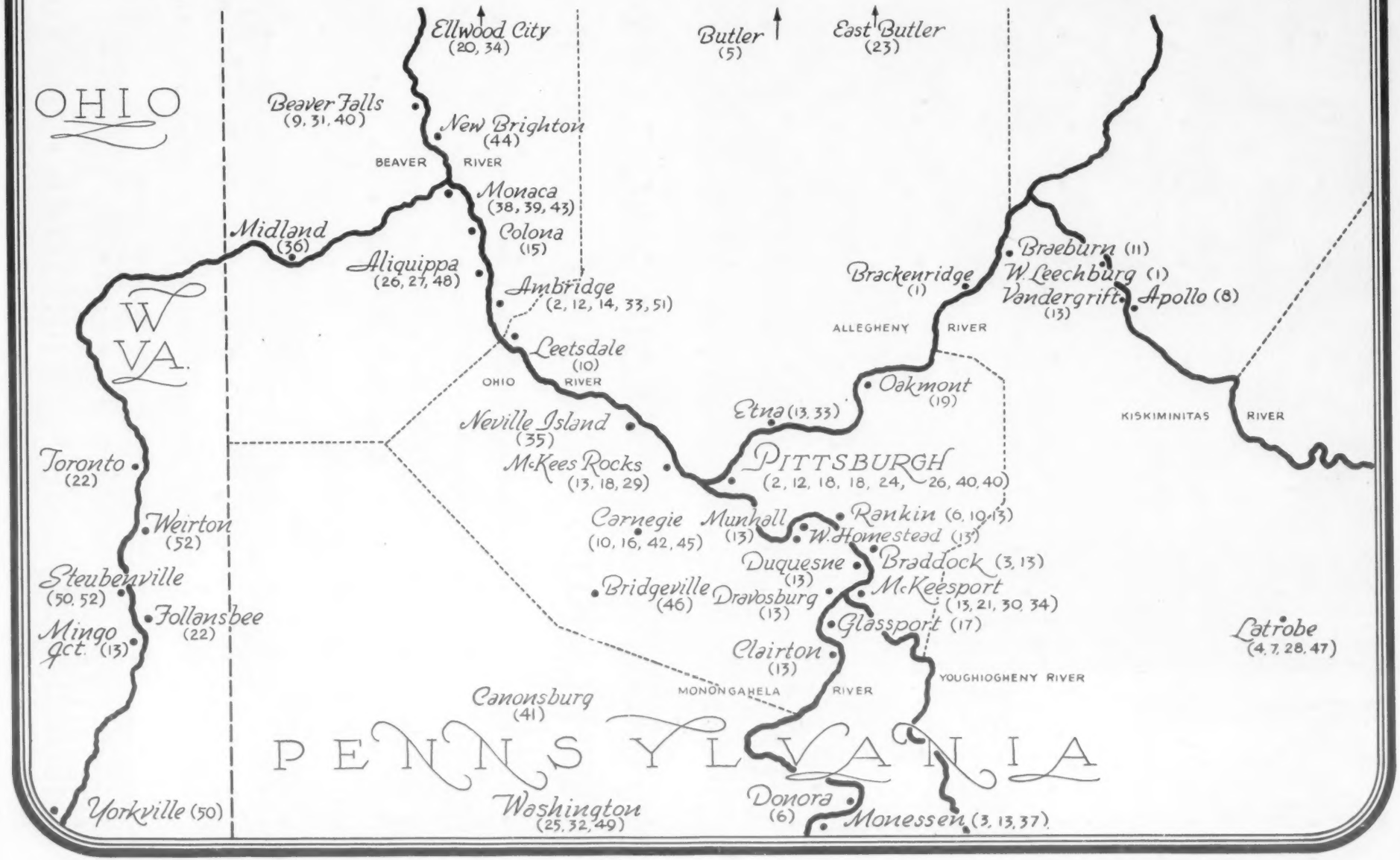
21. Firth-Sterling Steel Co.,
49. Washington Tin Plate Co.,

Follansbee, W. Va.
- Follansbee Bros. Co.

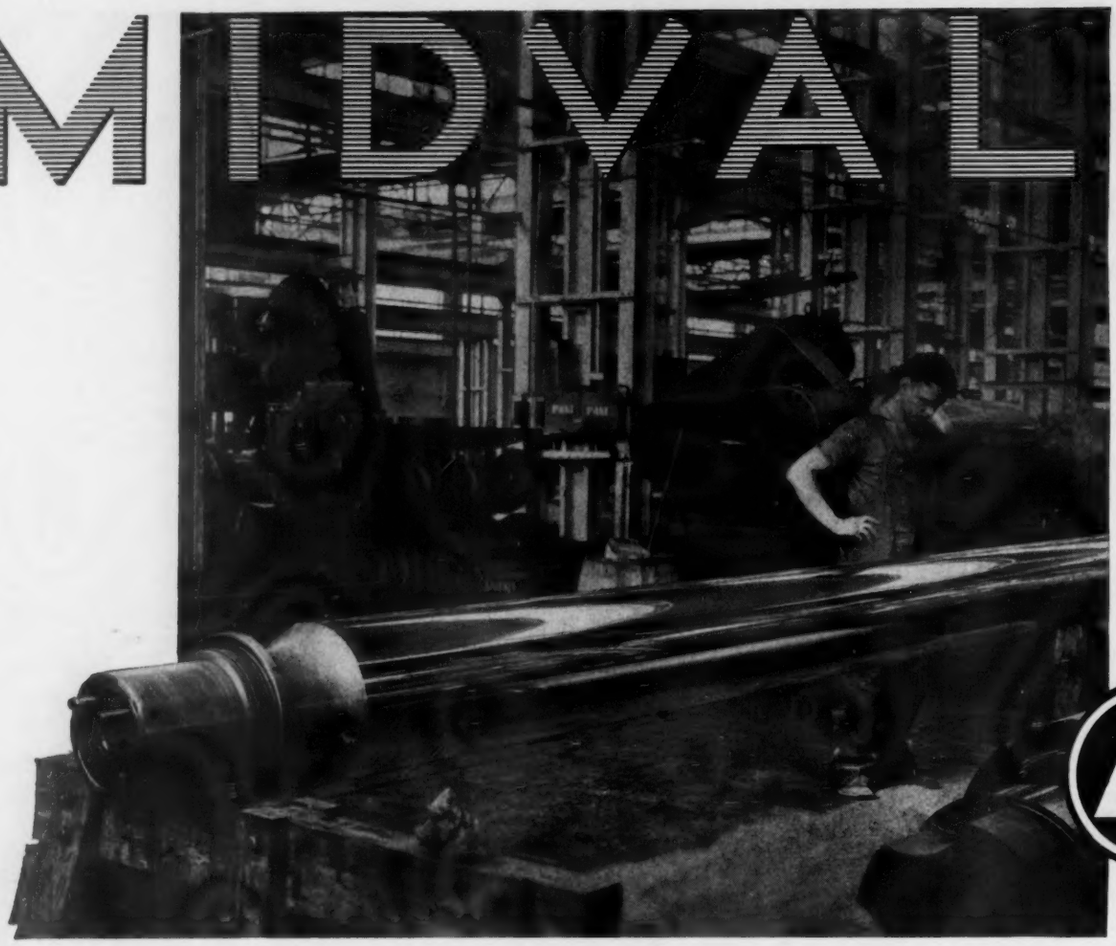
Molybdenum Corp.
Washington Tin Plate Co.

21. Firth-Sterling Steel Co., McKeesport, Pa.
22. Follansbee Bros. Co., Follansbee, W. Va.; Toronto, O.
23. Fretz-Moon Tube Co., E. Butler, Pa.
24. Heppenstall Co., Pittsburgh.
25. Jessop Steel Co., Washington, Pa.
49. Washington Tin Plate Co., Washington, Pa.
50. Wheeling Steel Corp., Beech Bottom, W. Va. (Not on map); Wheeling, W. Va. (Not on map); Steubenville, O., Yorkville, O.
51. Wyckoff Drawn Steel Co., Ambridge, Pa.
52. Weirton Steel Co., Weirton, W. Va.; Steubenville, O.

Follansbee, W. Va.
  Follansbee Bros. Co.
Glassport, Pa.
  Copperweld Steel Co.
Latrobe, Pa.
  American Locomotive Works.
  Anchor Drawn Steel Co.
  Latrobe Electric Steel Co.
  Vanadium-Alloys Steel Co. (Colonial)
Leetsdale, Pa.
  Bethlehem Steel Corp.
Molybdenum Corp.
  Washington Tin Plate Co.
West Homestead, Pa.
  Carnegie-Illinois Steel Corp.—Howard Axle Works
West Leechburg, Pa.
  Allegheny Ludlum Steel Corp.
Weirton, W. Va.
  Weirton Steel Co.
Yorkville, O.
  Wheeling Steel Corp.



MIDVALE



HARDENED AND GROUND ROLLS PROTECT BOTH QUALITY OF OUTPUT . . . AND ITS COST

Roll failures due to metallurgical defects do several things. They delay deliveries—which does not improve customer relations. They lower the quality of output—which may mean costly re-rolling. They tie up the whole shop—which also is expensive.

Midvale has had experience with hardened and ground rolls equaled by few firms in the whole world. We have made them for rolling practically every type of metal, and know from experience the requirements of each.

THE MIDVALE COMPANY • NICETOWN • PHILADELPHIA

OFFICES: *New York • Chicago • Pittsburgh • Washington • Cleveland • San Francisco*

Produces a hot plastic condition without washing

A User of AMCO PIT FURNACES *says:*

"I would say the day is past when any kind of steel should be washed. With the modern AMCO PIT FURNACES it is possible to produce a very hot plastic condition *without any washing.*"

AMCO PIT FURNACES

Ask for Bulletin 198, presenting interesting AMCO case-history tests!

The AMSLER-MORTON COMPANY

FULTON BUILDING • PITTSBURGH, PA.

Uncertainty vs
IN STEELMAKING

Technological advancement continues to exert far-reaching effects but external factors appear to retard its full use. Now more than ever, management must study developments, use them to full advantage to maintain competitive position

Technology

■ PROBABLY there have been more trying times in the steel industry than today. Certainly there have been times of greater profits, as well as of lesser profits. There also have been periods of more vital technical developments.

Present conditions in the industry, however, are different. The way ahead is clouded; the rules have been changed. Uncertainty is the watchword and for that reason all normal problems are magnified beyond reasonable size.

The financial position of the industry as a whole is fair. The physical condition of much equipment makes it imperative to draw on financial resources for renovating and for new construction in the near future if the high standards of quality are to be maintained, but there is one factor which holds back the pouring out of the industry's money into new equipment—the uncertainty as to the future possibility for profits even with the best equipment.

The problem is a dual one, involving marketing practices in the industry as well as government factors. The first, being internal, will in time be solved. The other remains the question mark which will determine to a large extent the future of the industry.

Developments Shelved

Probably the most significant result of the hesitancy arising from this uncertainty is the lack of opportunities for technologists to apply the principles of new developments to actual practice. Innumerable new developments which might mean progress in steelmaking are on the shelf, awaiting a favorable moment for a tryout.

Technical progress is still, as it has long been, the most important single factor in the development of the steel industry. It is true indeed that currently other factors have increased in importance and are demanding more attention on the part of management, but many of these, including the more important ones such as labor and the price structure, are dependent in a large degree on the developments in the field of steel mill technology.

Thus it is of increasing importance for steel management to keep itself aware of the possibilities for the future which lie hidden in today's technological advances. It is still possible for new processes and new products to upset the current order completely, as the

Left, one field where research has made great strides in product improvement has been alloy steels. New alloys for special purposes now are legion. Large tonnage comes from furnaces like this at the Brackenridge plant of Allegheny-Ludlum Steel Corp. At right, tube mills serve many industries, oil companies perhaps being the largest consumer

continuous strip mill has done in the flat rolled steel picture since the Butler mill started to roll in 1926.

As a matter of fact, there are new developments today which point the way to important changes in the future. Some of these are technical, some are not. On each there is a great deal of disagreement and only time will supply the perspective by which their importance can be judged. For example, one nontechnical factor which has caused some concern among mill men has been the decline in demand for heavy structural materials in favor of lighter sections. There are mills in this country today which are heavily overpowered for the majority of the steel being rolled on them as a result of this veer toward lighter sections. Naturally this condition does not make a good picture on the cost sheets. Lighter, more flexible mills enable competition to show a considerable cost advantage, although the larger mill may be faster and have a considerably larger capacity.

On the technical side, it seems inevitable that improvements in the actual production of steel—in the open hearth and in the bessemer—will shortly require renovating of existing facilities. Steps in this direction already have appeared, with closer control of the bessemer process through photoelectric methods an accomplished fact. Refinements in the open hearth furnace have produced records such as the 135-ton furnace which has produced over 10,000 tons per month.

Conflicting Opinions Are Held on Developments

Developments such as these are being watched closely by management in order to gain some idea of the future trends and needs of the industry. That there is a wide divergence of views is apparent. Conflicting opinions are common. For this reason, technical meetings such as the forthcoming Pittsburgh meeting of the Association of Iron and Steel Engineers hold considerably more than normal interest.

Modernization of present equipment through applications of newly developed devices and technique is going forward constantly, such as in heating equipment. One expert on steel heating equipment recently stated that the majority of furnaces used today were designed and built with the quality of steel produced ten years ago in mind. Since today's customer demands qualities in steel which were produced only on special order ten years ago, use of obsolete heating equipment usually means out-of-line costs or a compromise with quality. This has resulted in considerable study of the heating problems and development of new furnaces which are in step with the demands of steel consumers.

Some rolling mill experts have pointed out that since the emphasis for so long has been on new mills for flat rolled materials, the state of bar and shape mills has been disregarded with the result that today there are very few mills of this type modernized in step with other departments of the industry. Technical development has kept pace; the industry has not yet availed itself of the existing improvements. Most authorities are agreed that a vast sum must be spent on modernizing this equipment within the next few years in order to meet needs of steel users .

Ultimate Objectives Remain Unchanged

Ultimate objects of all this technical development remain unchanged. They are now, as they have been for the past decade, uniformity of quality, greater efficiency in all operations and the maintenance of an economic balance between the stockholders, the workers and the customers of the industry. Since it is evident the last factor exerts considerable influence over the other two, it is also obvious that technical developments are influenced by this factor also.

That this is true is readily seen by efforts of the industry to maintain the lowest possible steel prices in order to increase volume and thus increase employment to offset the decline due to mechanization. Increased costs per unit of labor has made it imperative for engineers to mechanize wherever possible. This factor has exerted considerable influence on technical developments and is most noticeable in materials handling operations.

Another quite important factor which is the subject of considerable study is maintenance. During the past decade there have been few periods of intense production. Maintenance costs run inverse to production; they drop per unit as tonnage increases. Thus in a period where production is constantly at low levels, maintenance costs become a problem of first magnitude.

Technical developments reducing maintenance expenses are numerous. Considerable work has been

Greater flexibility and higher production volume are expected to lower costs at the new structural mill recently placed in service by National Steel Corp. at its Weirton plant

ALL TRULY GREAT DISCOVERIES ARE *SIMPLE!*

Cover Painting from Liberty Magazine
by Courtesy of Macfadden Publications

Many of our discoveries overtake us at an early age . . . but men had been using fires for centuries without considering the importance of air . . . just because it had always been FREE!

But in the '90's, the founder of KEMP OF BALTIMORE made the discovery that is the basis of all Kemp equipment today . . . that you don't have to wait 'till your fire is kindled to apply the air . . . that you can mix the air with the fuel before-hand . . . that when you do, you get more fire out of less fuel and a controllability hitherto unheard-of. Sounds simple, *is* simple. All truly great discoveries *are* simple.

KEMP of BALTIMORE

MODERN CIVILIZATION *is built on* STEEL

. . . for only *steel* is strong enough to harness the modern giants of steam, electricity, internal combustion; to rear towers of stone a thousand feet in the air; to support on bridges and causeways the modern white man's burden. And the part that Kemp of Baltimore is playing in making better steel at less cost is tersely highlighted in these pages.

● ● ●

More and More producers of quality steel are turning to the Kemp Atmos-Gas Producer for bright annealing. In fact, the preponderance of Kemp equipment in the new mills suggests a *trend* to this complete, compact, continuous, automatic Atmos-Gas Producer that has brought production costs to a new all-time low.

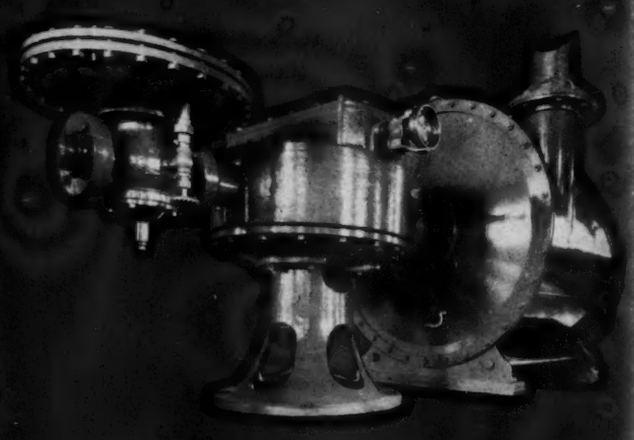
These Kemp units provide capacities of 1,000 CFH to 25,000 CFH and are designed to fit the job, incorporating the auxiliaries necessary to the various treatments and materials.

A new descriptive folder and Special Bulletin A 101-6 will give you details.

● ● ●

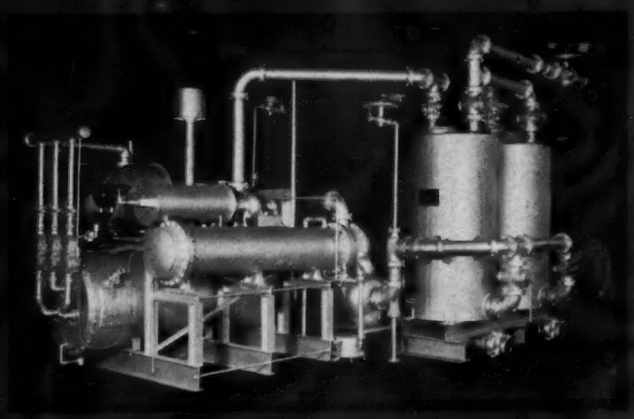
In the radiant heat annealing covers (Swindell-Dressler) shown at right, gas and air, premixed for complete combustion by the Industrial Carburetor, is burned in the exclusively Kemp Recirculating Radiator, which has the unique closed circuit return travel of the products of combustion.

Suitable for continuous or batch type furnaces, this Radiator daily proves its unchallenged superiority in leading sheet mill annealing departments.



The INDUSTRIAL CARBURETOR

Heart of all Kemp equipment, supplies 100% premixed gas and air for exactly the kind of flame required. By a single micro-adjustment all burners respond to give the desired flame analysis.



ATMOS-GAS PRODUCER

Capacities 1,000 to 25,000 CFH refrigeration, activated alumina or silica-gel dryers. Constant Analysis Monitor optional.

ANNEALING COVERS

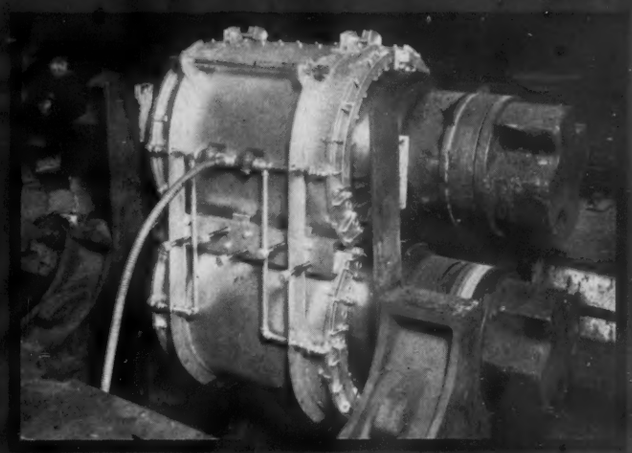
Swindell-Dressler Type
Batch and Continuous

KEMP OF

405 EAST OLIVER STREET

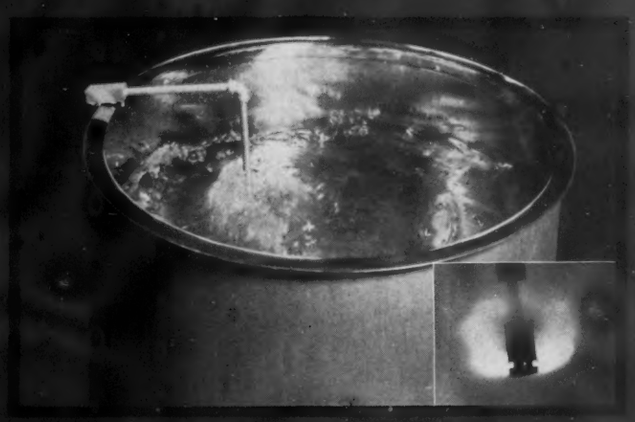
IMMERSION-HEATED TIN-POTS

Faster Delivery—Less Dross—Lower Fuel Costs



RADIATUBE ROLL-HEATERS

Faster Heating and Organic Fuel Savings



SUBMERGED COMBUSTION

for Solution Heating

Kemp Immersion Melting stands for maximum production at minimum cost in *modern* tin stacks the world over. When tin pots are equipped for this better, faster, cheaper way of melting, no crew and no machine can out-step hot metal.

That's why the installation shown at left was designed and built for Kemp Immersion Melting . . . making this an important part of one of the world's largest and most efficient tin-plate mills. Remember, *speed* is only part of the Kemp story. Kemp also gives you more accurate, fully automatic temperature control, less dross and material savings in fuel.

● ● ●

RADIATUBE Roll Heaters, for preheating of hot mills, provide the desired radiant heat from low-priced gas premixed by the Kemp Industrial Carburetor, at savings reported as high as 83⅓%.

A series of alloy-steel tubes, fired alternately from opposite ends, transfer radiant heat from a high velocity, constant-pressure flame that burns to complete combustion. The unit is heavily insulated and designed to conform to roll contour. Radiatube saves money, saves time, gives more accurate control.

● ● ●

Kemp Submerged Combustion Units actually burn fuel when immersed in the fluid being heated, discharging the products of combustion through the solution, at virtually 100% heat transfer. At the same time effective agitation and uniform heat distribution is secured. Submerged combustion units of corrosion resisting metals are providing an efficient, flexible and non-diluting answer to difficult solution heating and concentration problems.

● ● ●

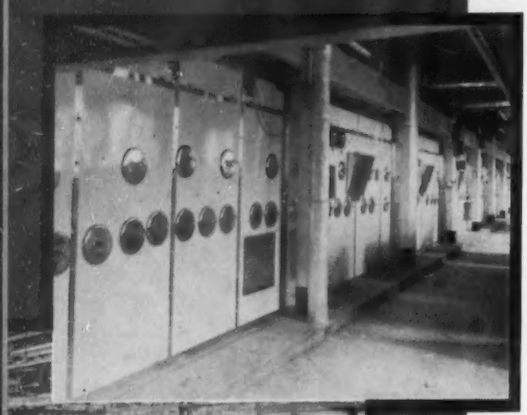
Kemp engineers, trained in steel mill practise, are at your service for consultation and information on heat-treating problems without obligation. For detailed bulletins on equipment noted in these pages, engineering advice or assistance, address The C. M. Kemp Manufacturing Co., 405 East Oliver Street, Baltimore, Maryland.

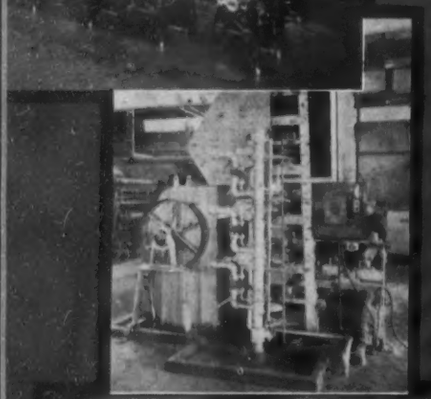
BALTIMORE

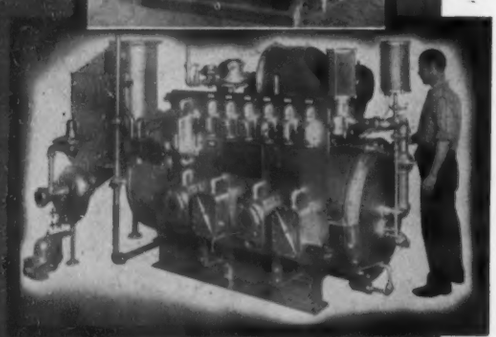
BALTIMORE, MARYLAND

Wherever Heat is used in Industry . . .

KEMP SERVES *and* SAVES







Automobiles to zwieback, top hats to tin-plate, the Kemp Industrial Carburetor and Kemp heating equipment bring new efficiency and new economy to industrial heating with gas. Somewhere among the 2,000 *specialized* Kemp installations is the answer to *your* heating problem. Examples that may be high lighted within the limits of this page serve four divergent fields:

for FOODS

Nation-wide, bakers and cereal manufacturers find the Industrial Carburetor saves 15 to 50% in fuel cost for bread and cracker baking, and even more on cereal toasting. The exclusive combustion characteristics of the Kemp application give uniformity of heating and constant duplication of satisfactory product.

for AUTOMOTIVE

The Industrial Carburetor serves spectacularly in supplying the efficient heating medium for the major producers of die cast hardware. Immersion Heating produces the majority of battery grids, while the Industrial Carburetor itself supplies the correct air-gas mixture for the most effective "running-in" of engines on the block.

for TEXTILES

Kemp *Flame-Compression* Singeing Equipment singes any grade of cloth as fast as you can handle it. Finishers report 75 to 100% increase in speed with 25 to 50% reduction in gas bills, singeing speeds running as high as 400 yards per minute.

Flame-Compression is exactly what the name implies. The combustion chamber of each burner is recessed, so that the cloth, drawn tightly over the machined surfaces of the raised lips at each side of the flame, actually *pushes down* this flame.

for CHEMICALS

The Inert Gas Producer, fully automatic in operation, is a typical Kemp achievement. The unit illustrated delivers from 25% to 100% of its 5,000 CFH rating of a gas having approximately 12½% CO_2, less than 0.5% CO, with the balance N_2 and zero O_2. NO, amounting to but a few parts per million, is held to hitherto unobtainably low concentrations. The Inert Gas Producer has push button control and is designed for installation in hazardous locations. For the economical production of a gas to isolate materials from the atmosphere, the Inert Gas Producer is the economical solution.

Whatever your own heating requirements, you will be following sound precedent in asking Kemp . . . without obligation, of course.

Branch Offices of The C. M. KEMP MFG. CO.

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LITTLE ROCK, ARK.

[illegible] Santa Fe Avenue
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ATLAS SCALE CARS AND TRANSFERS

assure lowest haulage costs

Atlas Transfers Used in Ore Yard and at Unloading Dock

100 TON—GABLE BOTTOM DUMP TRANSFER CARS

6-Wheel Welded steel trucks provided with anti-friction self-aligning bearings

Motor-driven discharge gates operated independently on each side of cars

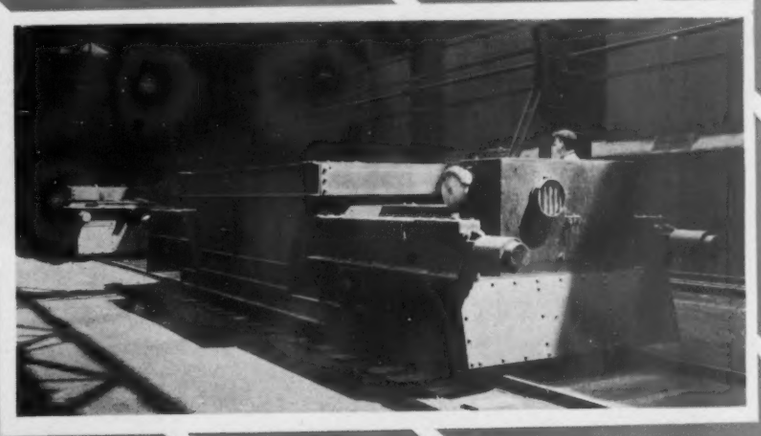
Elevated operators cab for observation of loading and car operation

Discharge gates and bottom of hopper plates provided with electrically operated heaters to prevent freezing of materials in cold weather.

Accurate Weighing of Burdens Recorded on Direct-Reading Tape is Accomplished with Atlas Scale Cars

320 CU. FT. CAPACITY—BOTTOM DUMP SCALE CARS

Atlas all-steel roller suspension type scale provided with Atlas Indicating Dial and Type Recording Apparatus permitting direct reading of separate burden weights. Cast-steel one piece side frame trucks with anti-friction self-aligning bearings.



Atlas Cars for Every Kind of Inter-Plant Haulage

ELECTRICALLY OPERATED BUCKET TRANSFER CARS. DOUBLE END OPERATION

●

ATLAS PRODUCTS

Electric Locomotives and Cars, Storage Battery Locomotives, Transfer Cars, Scale Charging Cars, Specially Designed Cars for All Purposes, Diesel Electric and Gas-Electric Locomotives, Storage Battery Trucks and Tractors, By-Product Coke and Gas Plant Equipment.

THE ATLAS CAR & MFG. CO.

Engineers *Manufacturers*

CLEVELAND, OHIO

done in lubrication, in bearing construction and operation and in kindred lines which bring down the deadweight of maintenance costs. Not a small factor has been the introduction of modern systems of recording maintenance costs, including apparatus performance, cost of upkeep and frequency of replacements.

Although research work in producing steel without recourse to the blast furnace steps is still going on, it is a losing proposition for the present. However, there are significant developments under way which doubtless will change the complexion of the iron producing picture.

The excess cost of wasteful bulk in iron production, including useless constituents of ores, coke and air, as well as the need for a purer metal are the incentives in the research toward "direct reduction." The rewards are great enough to keep this work going on; meanwhile, present blast furnace methods are being entrenched by ore beneficiation procedures which will in part eliminate the deadweight of the ores and reduce blast furnace costs. Lower carbon content also is being pressed by other methods and it is possible that new methods in the blast furnace will be able to lower carbon contents and consequently lower time of open hearth heats and increase furnace capacity without enlarging furnaces.

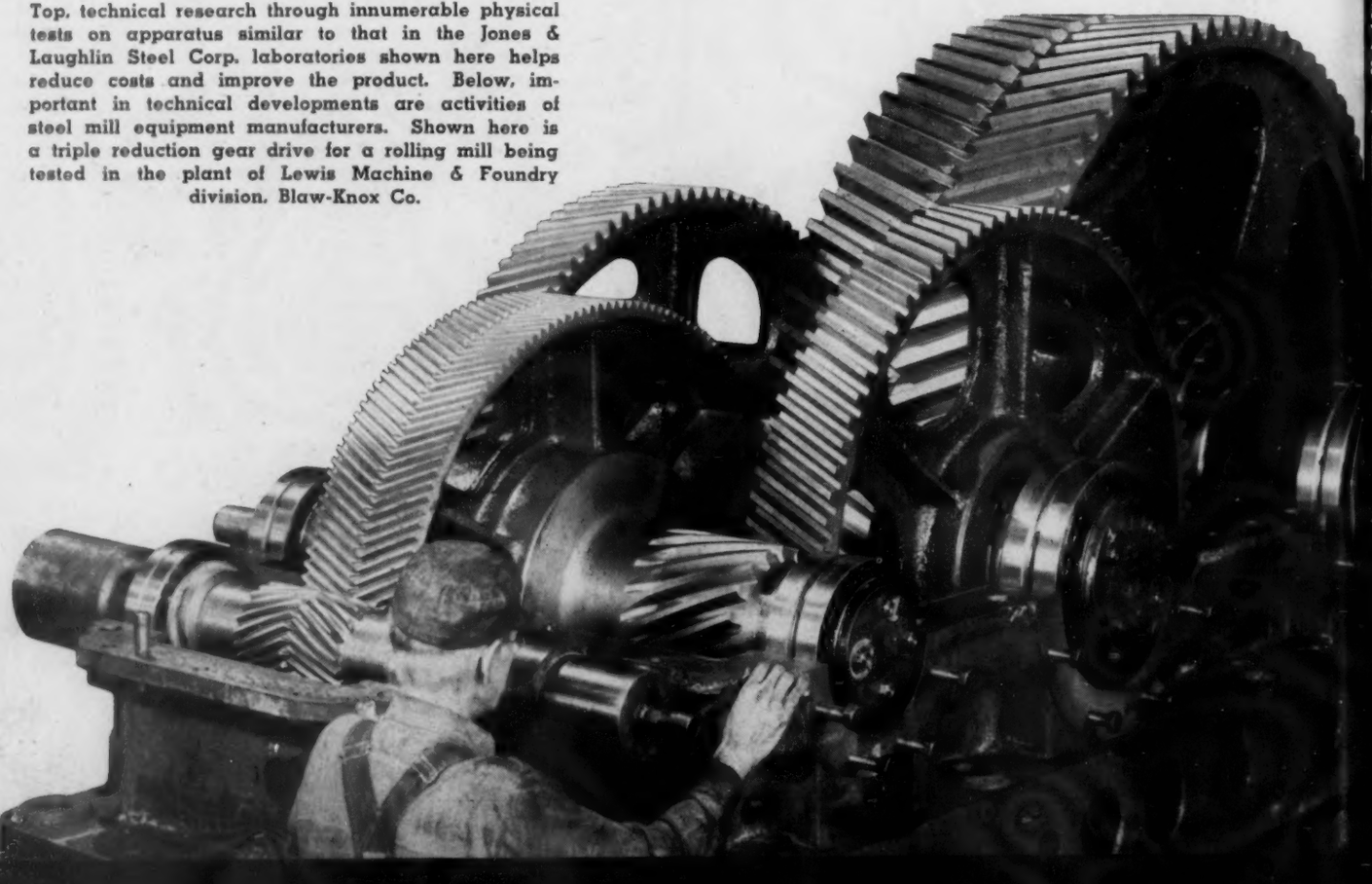
Costs Must Be Lowered

There are other technical developments, some sweeping and some unimportant, which have not yet been given a chance to get into practice and prove their worth. There are two factors which govern the decision as to whether or not these shall be used—first, will the new development lower costs, and second, will it produce a better product?

It is vitally important today for costs to be lowered, because the return to the stockholders has been and still is inadequate. Higher prices for the finished product is not the answer. Management has learned from experience that higher prices, being an external factor, bring down the wrath of competition, of labor and of government. Reducing internal costs is by far the better way to increase returns.

Better products likewise are vital. It is only through improvement of products that competitive position can be bettered. If technical developments can do this job, the expenditures must be made. It is imperative that today's management scrutinize carefully the fruits of technological advance and bend every effort to make this work serve its purpose.

Top, technical research through innumerable physical tests on apparatus similar to that in the Jones & Laughlin Steel Corp. laboratories shown here helps reduce costs and improve the product. Below, important in technical developments are activities of steel mill equipment manufacturers. Shown here is a triple reduction gear drive for a rolling mill being tested in the plant of Lewis Machine & Foundry division, Blaw-Knox Co.

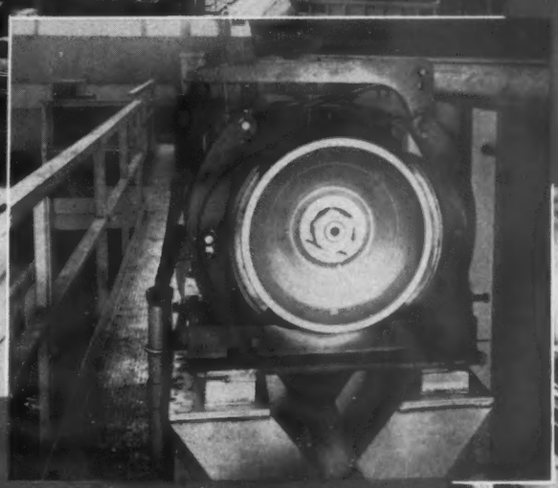


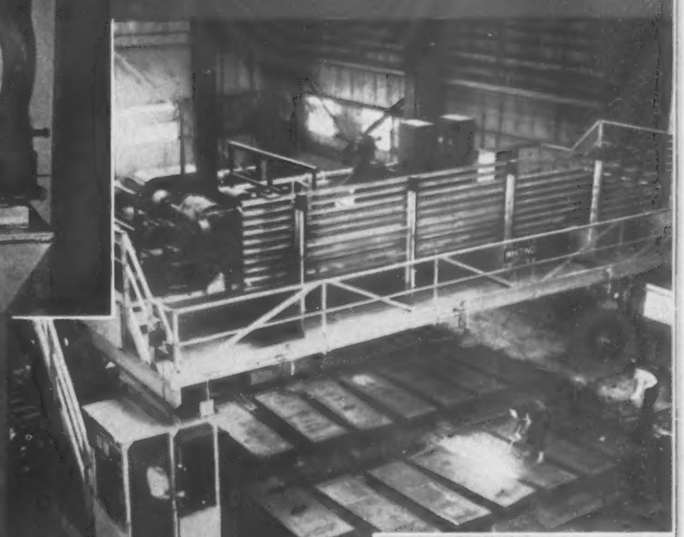
WAGNER HYDRAULIC BRIDGE BRAKES

At the IRVIN WORKS

Wagner Hydraulic Bridge Brakes have many outstanding advantages, a few of which are enumerated below:—

1. Provide smooth powerful braking.
2. Permit more accurate placing of loads.
3. Insure quick, safe stops when power fails.
4. Equal torque at each brake on double bridge drives.
5. Eliminate maintenance of linkage and shafting.
6. Permit prohibition of motor plugging.
7. Save space because linkage is not required.
8. Reduce maintenance cost.





This Catalog on **HYDRAULIC BRAKES**

for overhead traveling cranes and other industrial applications, should be in the hands of all present users of hydraulic brakes. It contains complete service instructions and parts information. It is also of interest to all plant engineers who have not yet taken advantage of the safety and economy features offered by hydraulic foot brakes for overhead traveling cranes. Write for your copy today. No obligation.

Wagner Electric Corporation

6400 Plymouth Avenue, Saint Louis, Mo., U.S.A.

BRAKES • TRANSFORMERS • FANS • MOTORS

POOLE
Flexible Couplings

FULLY LUBRICATED
DUST PROOF
OIL TIGHT

ALL METAL
NO WELDED PARTS
FREE END FLOAT

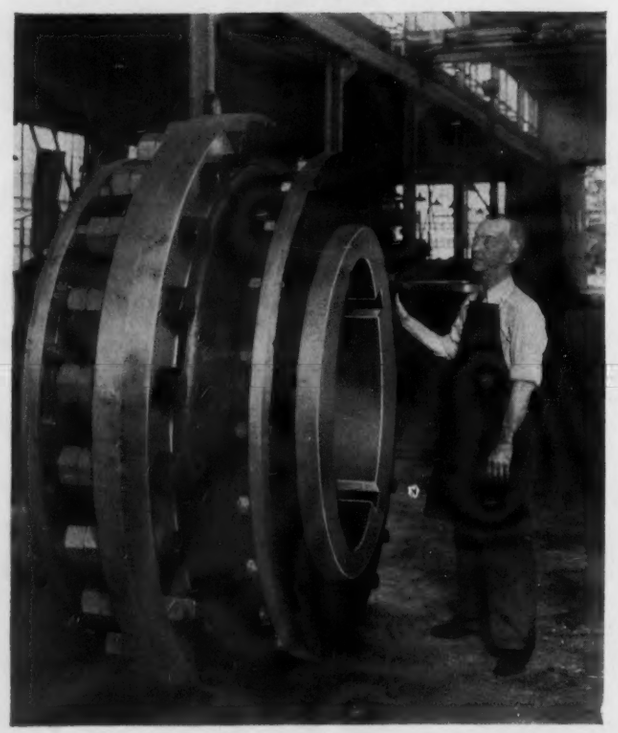
It gives full compensation for the unavoidable errors in alignment or those caused by changes of temperature, wear of bearings, vibration, etc. It also permits free lateral float to connected shafts, and prevents torsional motions. Stronger than the connecting shafts. Capable of sudden reversals at high speed or heavy duty, slow speed drives without strain to the coupling or the machinery it connects. Simple in design, no springs, pins or bushings, self-aligning, silent and vibrationless at all times.

Send for a copy of our

Flexible Coupling Handbook

NO. 26 POOLE HEAVY DUTY CAST STEEL MILL TYPE FLEXIBLE COUPLING SHOWN IN ILLUSTRATION ON THE RIGHT.

TOTAL WEIGHT 15 TONS.



THIS COUPLING USED ON BLOOMING MILL DRIVE

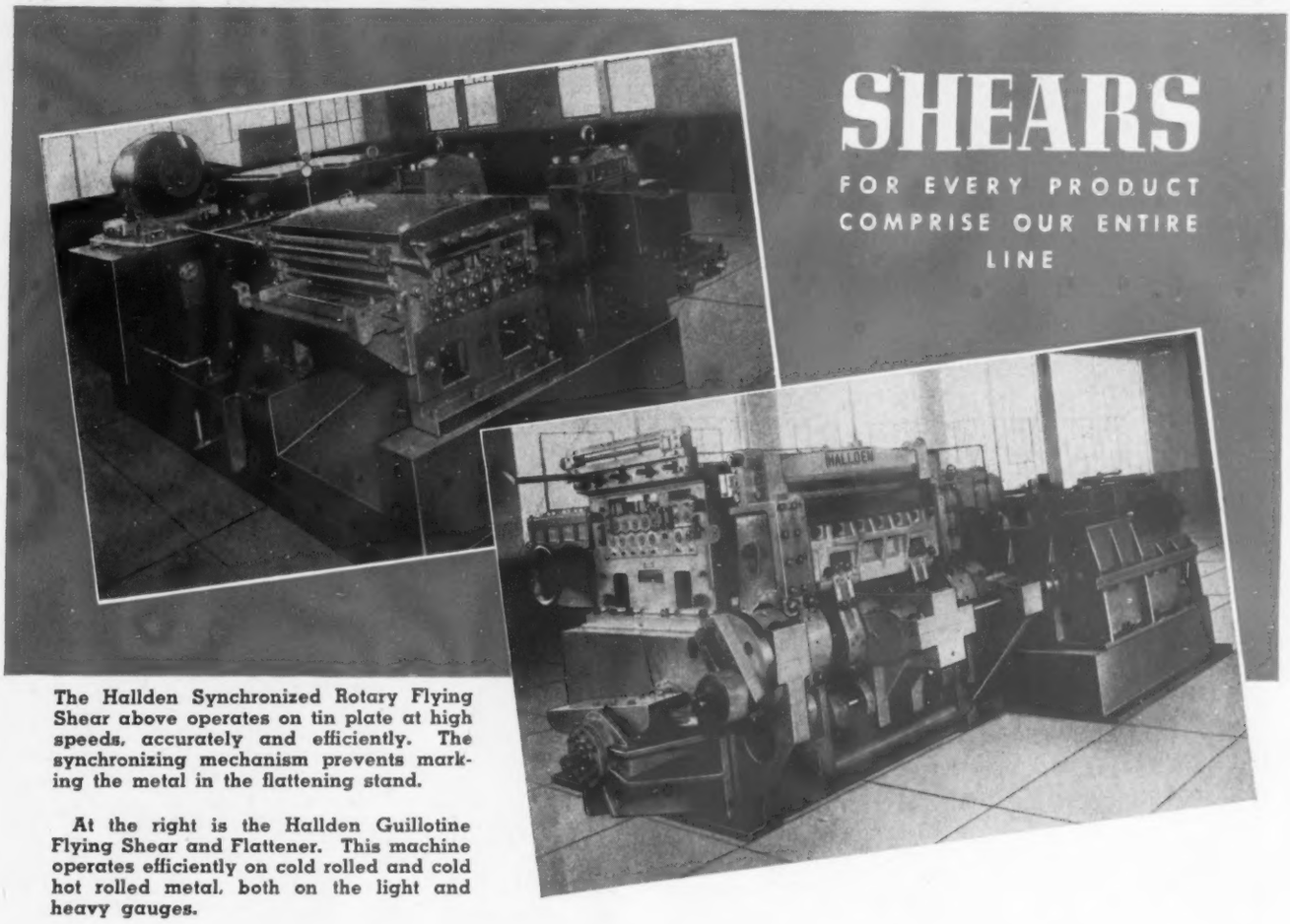
38,000 HP. AT 100 RPM.

OUTSIDE DIAMETER 77".

POOLE FOUNDRY & MACHINE COMPANY

BALTIMORE, MARYLAND

SPECIALISTS



The Hallden Synchronized Rotary Flying Shear above operates on tin plate at high speeds, accurately and efficiently. The synchronizing mechanism prevents marking the metal in the flattening stand.

At the right is the Hallden Guillotine Flying Shear and Flattener. This machine operates efficiently on cold rolled and cold hot rolled metal, both on the light and heavy gauges.

Specializing in one product exclusively has established Hallden as a leader in the manufacture of Flying Shears. Automatic levellers and shears for steel and nonferrous metals, shears for round, square or hexagon wire and shears for special applications are among the Hallden products. Consult us about your shear problems.

THE HALLDEN MACHINE CO.

THOMASTON, CONN.

ASSOCIATED COMPANIES • THE WEAN ENGINEERING COMPANY, INC.— WARREN, OHIO
• W. H. A. ROBERTSON & COMPANY, LTD — BEDFORD, ENGLAND

■ DEVELOPMENTS in technical methods and equipment will highlight the thirty-fifth annual Iron and Steel Exposition to be held in Pittsburgh's Hotel William Penn. All convention and exposition activities will be under one roof. The 26 papers to be presented will cover the six main divisions: Electrical engineering, mechanical engineering, welding engineering, operating practice, combustion engineering and lubrication. Exhibitors will number 95.

In addition to technical sessions, two interesting inspection trips are planned. The first, Wednesday, Sept. 27, will cover Carnegie-Illinois Steel Corp.'s Irvin works, the "Mill on the Hill." Friday, Sept. 29, the same company's Edgar Thomson works will hold open house. Here is the new slabbing mill which supplies slabs for the Irvin works.

Social program includes two dances and other special features. Exhibitor's informal dance is scheduled for Tuesday with a formal banquet and dance to wind up convention activities Thursday evening. Highlights of this affair include an address by B. F. Fairless, president, United States Steel Corp., Pittsburgh, and a talk by Strickland Gillilan, nationally known humorist.

Tuesday, Sept. 26

9:00 A. M.—MAIN LOBBY

Registration

Chairman: Freeman H. Dyke, Supt., Blooming, Bar and Hot Strip Mills, Wheeling Steel Corp., Steubenville, O.

Vice Chairman: L. V. Black, Elec. Supt., Bethlehem Steel Co., Bethlehem, Pa.

9:00 A. M.—ROOM 1075

Ladies Registration

9:15 A. M.—FORUM ROOM, 17TH FLOOR

Business Session

Chairman: C. C. Wales, Cleveland.

Vice Chairman: J. L. Miller, Asst. Ch. Combustion Eng., Republic Steel Corp., Cleveland.

9:30 A. M.—FORUM ROOM, 17TH FLOOR

Electrical Engineering Division

Chairman: W. A. Perry, Supt., Electrical and Power Depts., Inland Steel Co., Indiana Harbor, Ind.

Vice Chairman: I. N. Tull, Elec. Supt., Republic Steel Corp., Cleveland.

"A Double Bus System for Power Transmission," by D. I. Bohn, Elec. Eng., Aluminum Co. of America, Pittsburgh, and J. E. Housley, Supt. of Power, Aluminum Co. of America, Alcoa, Tenn.

"Vacuum Tube Control for Steel Mill Applications," by H. L. Palmer, Electronic Section, and H. W. Poole, Steel Mill Section, General Electric Co., Schenectady, N. Y.

"The Transition from 25 to 60 Cycle Power in the Steel Industry," by W. B. Skinkle, Secretary and Eng., Pittsburgh District Power Committee, United States Steel Corp., Pittsburgh.

12:30 P. M.—SOUTH HILLS COUNTRY CLUB

Ladies Luncheon Bridge

1:30 P. M.—FORUM ROOM, 17TH FLOOR

Mechanical Engineering Division

Chairman: C. J. Duby, Ch. Eng., Youngstown and Warren Districts, Republic Steel Corp., Youngstown, O.

Vice Chairman: J. D. Jones, Ch. Eng., Youngstown Sheet & Tube Co., Youngstown, O.

"Economics of Advanced Engineering Planning," by A. R. Schulze, Ch. Eng., Carnegie-Illinois Steel Corp., Youngstown, O.

"Modernization of Existing Open Hearth Furnaces and Auxiliary Equipment," by G. L. Danforth, Jr., Open Hearth Combustion Co., Chicago.

"Developments in Rolling Flat Steel Products—1939," by Stephen Badlam, Consulting Eng., Pittsburgh.

1:30 P. M.—CLUB FLOOR

Welding Engineering Division

Chairman: Wray Dudley, Asst. Supt. of Maint., National Tube Co., McKeesport, Pa.

Vice Chairman: E. W. Trexler, Maintenance Supt., Bethlehem Steel Co., Johnstown, Pa.

"Stress Relief in Welded Structure," by Dr. J. C. Hodge, Ch. Metallurgist, Babcock & Wilcox Co., Barberton, O.

"The Welding of Rail Ends and Joints of Crane Runways," by Wray Dudley, Asst. Supt. of Maintenance, National Tube Co., McKeesport, Pa.

"Welding Electrodes and Their Applications," by J. H. Deppeler, Ch. Eng., Metal and Thermit Corp., New York.

"Automatic Atomic Hydrogen Welding of Steel," by J. T. Catlett, General Electric Co., Schenectady, N. Y.

10:00 P. M.—CARDINAL ROOM

Exhibitors' Dance—Informal

Wednesday, Sept. 27

9:00 A. M.—CARDINAL ROOM

Operating Practice Division

Chairman: H. G. R. Bennett, Asst. Gen. Supt., Carnegie-Illinois Steel Corp., Duquesne, Pa.

Vice Chairman: W. C. McConnell, Plant Supt., Republic Steel Corp., Massillon, O. Symposium on the Preparation of Steel for Subsequent Rolling:

"Preparation of Semi-finished Steel," by A. P. Spooner, Metallurgical Eng., Bethlehem Steel Co., Bethlehem, Pa.

"Mechanical Billet Chipping," by G. W. Lentz, Ch. Eng., Bonnot Co., Canton, O.

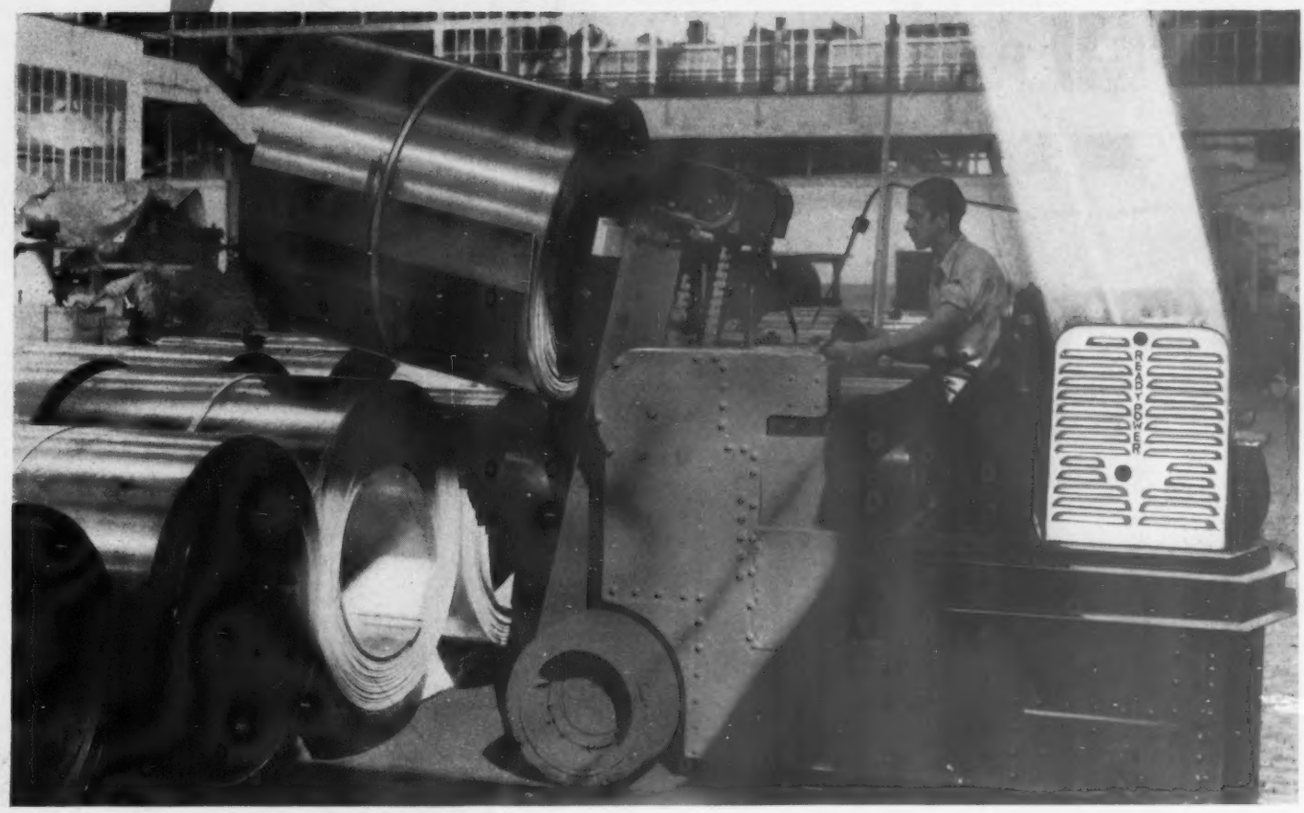
"Steel Conditioning with the Oxyacetylene Method," by G. D. Winlack, Air Reduction Sales Co., New York.

"Billet Grinding," by A. Rousseau, Norton Co., Worcester, Mass.

FOR

Greater Tonnage

and UNINTERRUPTED SERVICE



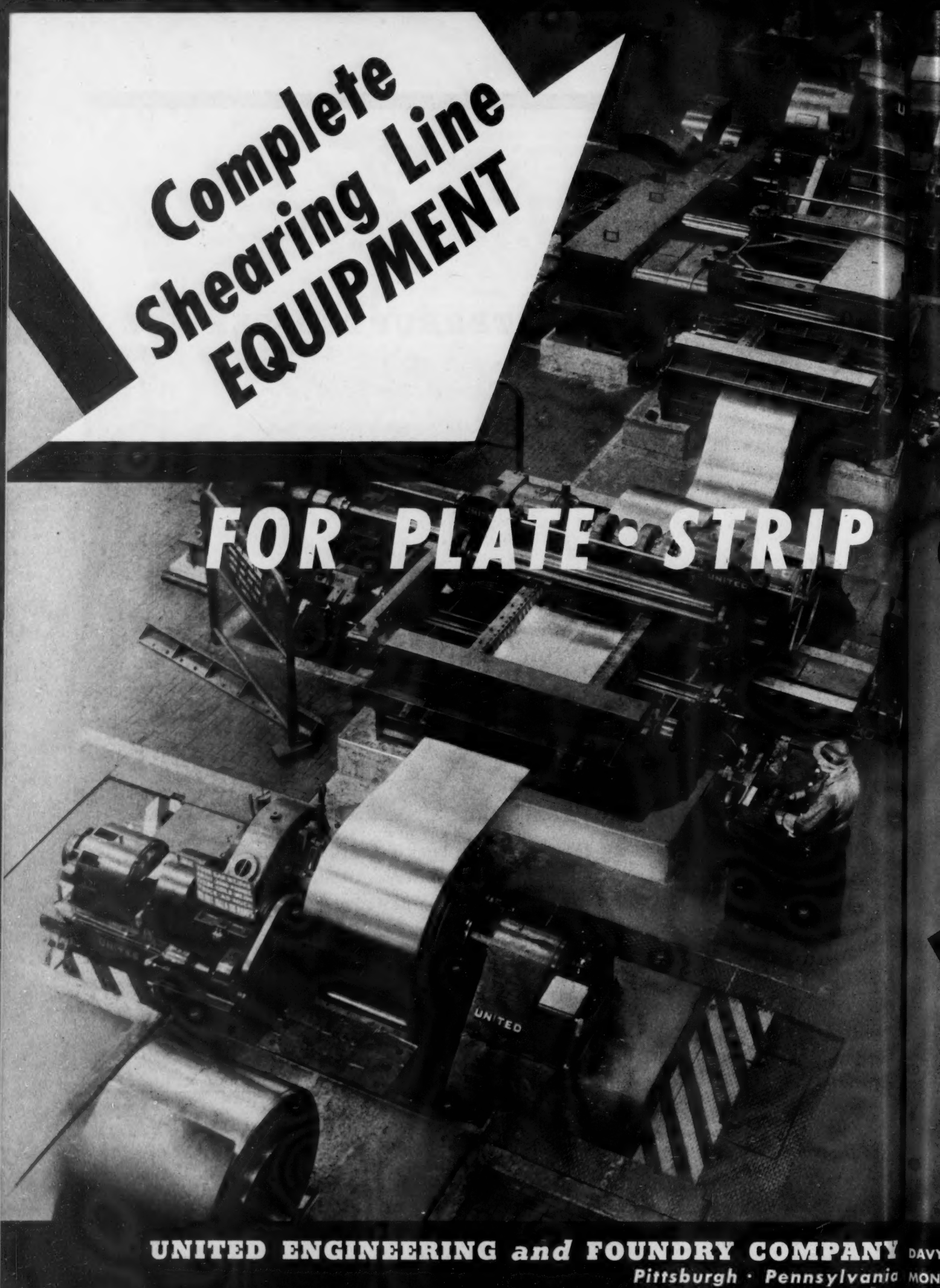
THIS INDUSTRY PREFERS
READY-POWER
EQUIPPED
ELECTRIC TRUCKS

● In twenty-four hour, six-day-per-week, steel mill operation, Ready-Power is proving its superiority, long life and economy of operation. Use READY-POWER, to be sure. Note: Ready-Power units are available for trucks from 2000 pound to 60,000 pound rated capacity.

See our exhibit at the Iron and Steel Exposition—space 72.

The READY-POWER CO.

3826 GRAND RIVER AVENUE • DETROIT, MICHIGAN, U. S. A.



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Pittsburgh · Pennsylvania

DAVY AND UNITED ENGINEERING COMPANY, LTD., SHEFFIELD, ENGLAND · DOMINION ENGINEERING WORKS, LTD., MONTREAL, P. Q. · UNITED INTERNATIONAL, S. A. PARIS, FRANCE · SHIBAURA-UNITED ENGINEERING CO., TOKYO, JAPAN

12:45 P. M.

Inspection Trip

80 inch Hot and Cold Strip Mills, Irvin Works, Carnegie-Illinois Steel Corp., Dravosburg, Pa.

2:00 P. M.—H. J. Heinz Co.

Ladies' Sight-seeing Trip

Foster Memorial, Cathedral of Learning, Heinz Chapel.

Thursday, Sept. 28

9:00 A. M.—Cardinal Room, 17th Floor

Electrical Engineering Division

Chairman: K. E. Dinius, Elec. Supt., Carnegie-Illinois Steel Corp., South Chicago, Ill.

Vice Chairman: L. R. Milburn, Elec. Eng., Great Lakes Steel Corp., Ecorse, Mich.

"Gauge Control for Cold Strip Mills," by F. Mohler, Elec. Eng., Steel Mill Section, General Electric Co., Schenectady, N. Y.

"Power Requirements of Cold Strip Mills," by A. F. Kenyon, Steel Mill Engineer, Industrial Dept., Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

"Development in Electrical Truck Transportation in Continuous Sheet and Strip Mills," by C. B. Crockett, Industrial Truck Statistical Association, Chicago.

9:00 A. M.—Forum Room, 17th Floor

Combusion Engineering Division

Chairman: G. M. Coughlin, Combustion Eng., American Rolling Mill Co., Ashland, Ky.

Vice Chairman: P. F. Kinyoun, Combustion Eng., Bethlehem Steel Co., Lackawanna, N. Y.

"Types and Selection of Refractories for the Steel Plant," by J. S. McDowell and J. P. Bankson, Harbison-Walker Refractories Co., Pittsburgh.

"Observations on the Heating of Steels from the Metallurgical Viewpoint," by E. E. Callinan, Combustion Eng., and Gilbert Soler, Director of Research, Steel and Tube Div., Timken Roller Bearing Co., Canton, O.

"Modern Gas-Mixing Systems as Applied to Steel Plant Requirements," by G. M. Arnold, Industrial Div., Cutler-Hammer, Inc., Chicago.

1:30 P. M.—Forum Room 17th Floor

Operating Practice Division

Chairman: J. G. West, Jr., District Supt., Blast Furnace and Coke Ovens, Youngstown Sheet & Tube Co., East Chicago, Ind.

Vice Chairman: A. H. Fosdick, Supt. Blast Furnace and Sintering Plant, Bethlehem Steel Co., Bethlehem, Pa.

"Yields of Coke and By-Products from Various Coals," by J. D. Davis, Supervising Chemist, Coal Carbonization Section, Bureau of Mines, Pittsburgh.

"Details in the Design of the New Inland Blast Furnace," by Hjalmar W. Johnson, Supt. of Blast Furnaces, Inland Steel Co., Indiana Harbor, Ind.

"Reconstructed Blast Furnace Shell of Welded Design," by L. J. Gould, Asst. Ch. Eng. of Construction, Bethlehem Steel Co., Bethlehem, Pa.

1:30 P. M.—Cardinal Room, 17th Floor

Lubrication Engineering Division

Chairman: F. L. Gray, Lubrication Eng., Carnegie-Illinois Steel Corp., Gary, Ind.

Vice Chairman: T. R. Moxley, Gen. Master Mechanic, Wheeling Steel Corp., Steubenville, O.

"Modern Lubrication of Existing Equipment," by F. J. Thomas, Lubrication Eng., Republic Steel Corp., Cleveland.

"Progress of Lubrication in the Steel Mills," by C. C. Pecu, Lubrication Eng., Bethlehem Steel Co., Lackawanna, N. Y.

"Causes of Gear Wear and Failure," by J. H. Jones, Metallurgist, Republic Steel Corp., Massillon, O.

7:00 P. M.

Formal Banquet: Main Lobby

Dance: Cardinal Room, 17th Floor

Speakers: B. F. Fairless, President, United States Steel Corp., Pittsburgh.

Strickland Gillilan, Author, Journalist and Commentator.

Friday, Sept. 29

9:00 A. M.

Inspection Trip

Edgar Thomson Works, Carnegie-Illinois Steel Corp., Braddock, Pa.

Air view of downtown Pittsburgh showing prominently in center the Wm. Penn hotel, headquarters for the convention and exposition

Presenting

New Roll Machine Shop
Just Completed

The Finest Roll Shop in the World!

OHIO ROLLS

CARBON STEEL ROLLS
ALLOY STEEL ROLLS
OHIOLOY "K" ROLLS
PLAIN CHILLED IRON ROLLS
ALLOY IRON ROLLS
DENSO-IRON ROLLS
MOLYBDENUM CHILL ROLLS
NICKEL CHILL ROLLS
FLINTUFF ROLLS

We announce with pride completion of this modern roll shop. This fine shop was built to maintain our leadership as makers of quality rolls -- to provide for a rapidly expanded roll business -- to insure precision machine work.

THE OHIO STEEL FOUNDRY CO.

LIMA, OHIO

SPRINGFIELD, OHIO

Neloy flame hardened industrial Gears and Track wheels

Note the discoloration on the flame-hardened surfaces of the gears shown above . . . An unretouched photograph.

You have at your command, when you do business with National-Erie, a wide range of gear cutting equipment for the production of spur, bevel, mitre, Sykes continuous Herringbone gears . . . The complete facilities of modern machine shops manned by expert machinists . . . Moreover, you have heat-treating facilities for fully quenched gears, which together with electric and open-hearth furnace foundry facilities, permit complete control of the manufacture of the materials you order . . . As you note above, a typical group of diversified industrial Neloy gears and crane track wheels for Neloy Flame Hardening treatments No. 10A and No. 10B . . . Make your source of supply for special steel castings and finished parts for your equipment, the National-Erie Corporation . . . Bulletins No. 5 and No. 6 are worth having on file for constant reference . . . They are yours for the asking.

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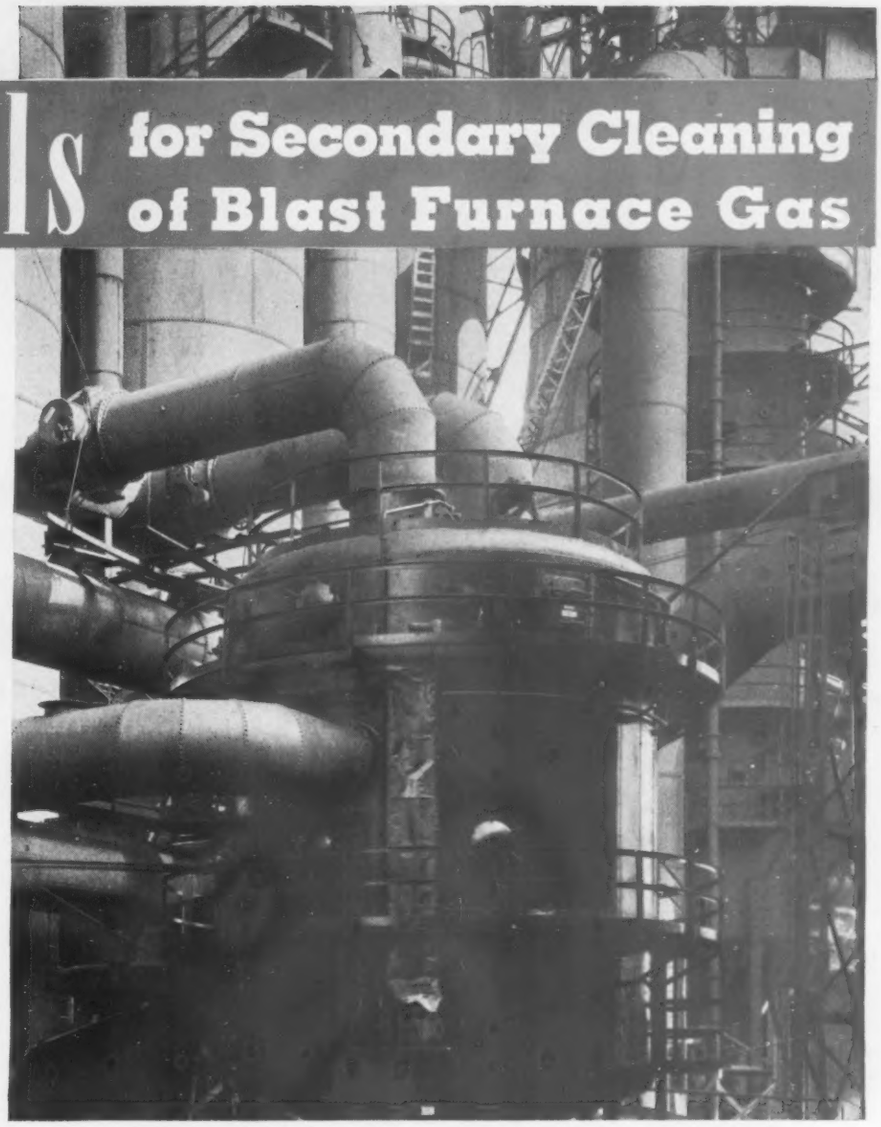
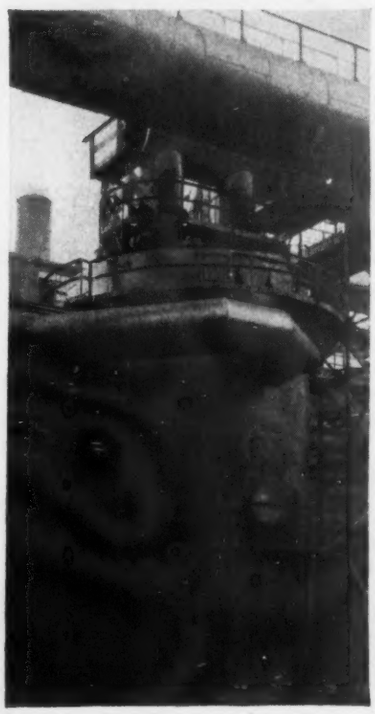
CORPORATION
ERIE, PA., U.S.A.

Cottrells for Secondary Cleaning of Blast Furnace Gas



TEN EXCLUSIVE FEATURES

1. Lowest draft loss—a few tenths of an inch w.g.
2. Lowest power cost—0.5 to 1.0 k.w. per 100,000 cubic feet of gas cleaned.
3. Lowest maintenance cost—all metal, no moving parts, no fire hazard.
4. Lowest labor cost—full automatic operation.
5. Long life—first industrial installation still operating after 33 years of continuous service.
6. Unlimited efficiency—approaching 100% if desired.
7. Universal applicability—collection of any suspended solid or liquid in any gas at any operating temperature.
8. Any capacity—a few c.f.m., or millions.
9. Flexibility—efficiency or capacity easily increased.
10. Lowest ultimate installation cost over years of service.



Cottrells Solve All Dust Problems

Blast furnace gas cleaned by Cottrell Electrical Precipitators is converted into free fuel in all the large steel mills in the world, for use in gas engines, underfired coke ovens, small checker stoves, soaking pits and open hearth furnaces. All entrained moisture is removed.

Installations are operating for cleaning gas to outlet dust content of .02 grains per cubic foot, and in some cases to well below .005 grains per cubic foot, dependent upon the cleaning requirements for subsequent use.

More than 3,000 diversified Cottrell installations in 31 countries throughout the world are maintaining performance records unapproached by any other equipment for the control of dust, fog, fume and mist.

As pioneers in this field, we will be glad to consult with you. We offer years of international experience and a complete range of both electrical (Cottrell) and mechanical (Multiclone) equipment for cleaning any gas,—to eliminate a nuisance, to recover values, or to make process gases available for specific use.

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TUESDAY	THURSDAY
9:00 A.M. to 10:00 P.M.	9:00 A.M. to 5:30 P.M.
WEDNESDAY	**FRIDAY**
9:00 A.M. to 10:00 P.M.	9:00 A.M. to 3:00 P.M.

All exhibits are in Hotel William Penn. Booths numbered from 1 to 37 are in main ballroom, 17th floor; from 38 to 58 in Urban room, 17th floor; from 59 to 104 in the Chatterbox, main lobby floor; 105 to 119 in Silver room, 17th floor; 120 to 129 in Adonis room, 17th floor; 200 to 215 in Italian Terrace, main lobby floor.

Booth No.

Alliance Machine Co., Alliance, O. 78
Cranes.

Allis-Chalmers Mfg. Co., Milwaukee 46-47-48
Electrical equipment.

Aluminum Co. of America, Pittsburgh.....112-114
Aluminum bus bars; housings, electrical specialties.

American Brake Shoe & Foundry Co., New York.127-128
Non-metallic bearings.

American Car & Foundry Co., New York.....95-96
Rolled steel; castings, stampings, forgings.

American Manganese Steel Co.,
Chicago Heights, Ill. 127-128
Alloy steel castings.

Amsler-Morton Co., Pittsburgh.....209-210
Heating equipment

Askania Regulator Co., Chicago.....121
Automatic combustion control equipment.

Automatic Transportation Co., Chicago.....85-86
Industrial trucks.

Bailey Meter Co., Cleveland.....18
Meters & control systems.

Baker-Raulang Co., Cleveland 93-94
Industrial trucks.

Bantam Bearings Corp., South Bend, Ind. 99-100
Antifriction mill bearings.

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Antifriction bearings.

Benjamin Electric Mfg. Co., Desplaines, Ill.....15-16
Lighting equipment.

Blaw-Knox Co., Blawnox, Pa. 60-61
Steel mill equipment and accessories.

Bristol Co., Waterbury, Conn. 59
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Charles Bruning Co. Inc., New York.....133-134-135
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Bussmann Mfg. Co., St. Louis 50-A
Fuses.

A. W. Cadman Mfg. Co., Pittsburgh 31
Babbitt metal; brass and bronze castings.

Clark Controller Co., Cleveland.....24-25-36-37
Controllers, switches.

Cleveland Crane & Engineering Co., Cleveland.....211
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Cleveland Worm & Gear Co., Cleveland.....79-80
Worm gear parts, speed reducers.

Colt's Patent Fire Arms Mfg. Co., Hartford, Conn....26
Motor controls, safety switches, circuit breakers.

Columbus McKinnon Chain Corp., Tonawanda, N. Y...4
Chains.

Crocker-Wheeler Electric Mfg. Co., Ampere, N. J.....83
D.C. mill motors, A.C. variable speed motors.

Crouse-Hinds Co., Syracuse, N. Y. 27
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Cutler-Hammer Inc., Milwaukee 28-29-32-33
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Steel-alkaline batteries.

Electric Storage Battery Co., Philadelphia 70
Industrial truck batteries.

Electric Controller & Mfg. Co., Cleveland 200-201-202-203
Lifting magnets, automatic controllers, motor starters. Elevator, crane and hoist control systems.

Electrical Engineers Equipment Co.,
Melrose Park, Ill. 21
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Elwell-Parker Electric Co., Cleveland 104
Industrial trucks.

Farrel-Birmingham Co. Inc., Ansonia, Conn. 71
Rolls, rolling mill equipment.

Farval Corp., Cleveland 79-80
Valves, central pumping units, lubricating equipment.

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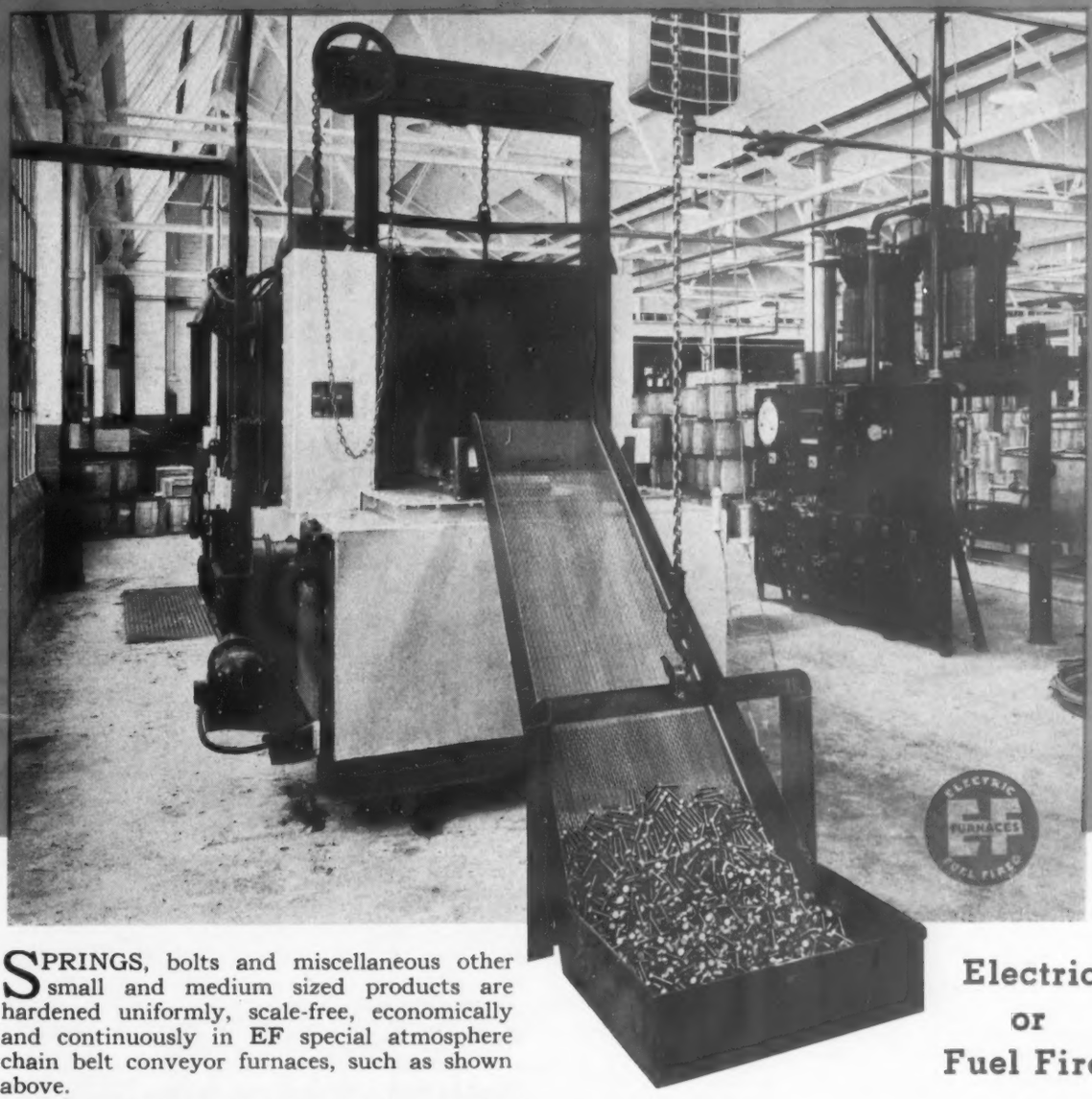
Gatke Corp., Chicago 130-131
Fabric bearings, gears, brake & clutch blocks, asbestos textiles.

General Electric Co., Schenectady, N. Y. .38-39-40-41-42-43
Motors, electrical equipment, controls, switchgear.

For Scale-Free Hardening

Miscellaneous Parts and Products - - - Continuously



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Built in five standard sizes with capacities ranging from 300 to 1700 lbs. per hour. Larger or smaller sizes can also be furnished.

Equipped with **EF** recuperative type gas fired radiant tubes or electrically heated.

We will be glad to give you complete information, including installation and operating costs, and show you clean hardened samples, if interested.

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Submit Your Furnace Problems to EF Engineers

The Electric Furnace Co., Salem, Ohio

Gas Fired, Oil Fired and Electric Furnaces---For Any Process, Product or Production

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Lighting equipment.

Graybar Electric Co. Inc., New York 207
Hoists, pneumatic tools, hand tools, motor maintenance equipment.

Hagan Corp., Pittsburgh 75
Automatic combustion controls for heavy duty heating furnaces.

Heppenstall Co., Pittsburgh 97-98
Shear knives, die blocks, tinning & galvanizing rolls.

Holophane Co. Inc., New York 23
Lighting equipment.

Homestead Valve Mfg. Co. Inc., Coraopolis, Pa. 101
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Hyatt Bearings Division, General Motors Sales Corp., Harrison, N. J. 74
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Ideal Commutator Dresser Co., Sycamore, Ill. 9
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I-T-E Circuit Breaker Co., Philadelphia 50
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Iron Age, New York .....
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Otis Elevator Co., New York 120
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Pennsylvania Electric Coil Corp., Pittsburgh 111
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Pyle-National Co., Chicago 7-8
Generators, turbines, conduit and switch materials.

Railway and Industrial Engineering Co., Greensburg, Pa. 3
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Ready-Power Co., Detroit 72
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Reliance Electric & Engineering Co., Cleveland 51-52-57-58
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Republic Flow Meters Co., Chicago 5
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H. Lee Reynolds Co., Pittsburgh 56
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Panelboards, switchboards, electrical supplies.

United Engineering & Foundry Co., Pittsburgh 10
Steel mill equipment.

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Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. 87-88-89-90-91-92
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Edwin L. Wiegand Co., Pittsburgh 14
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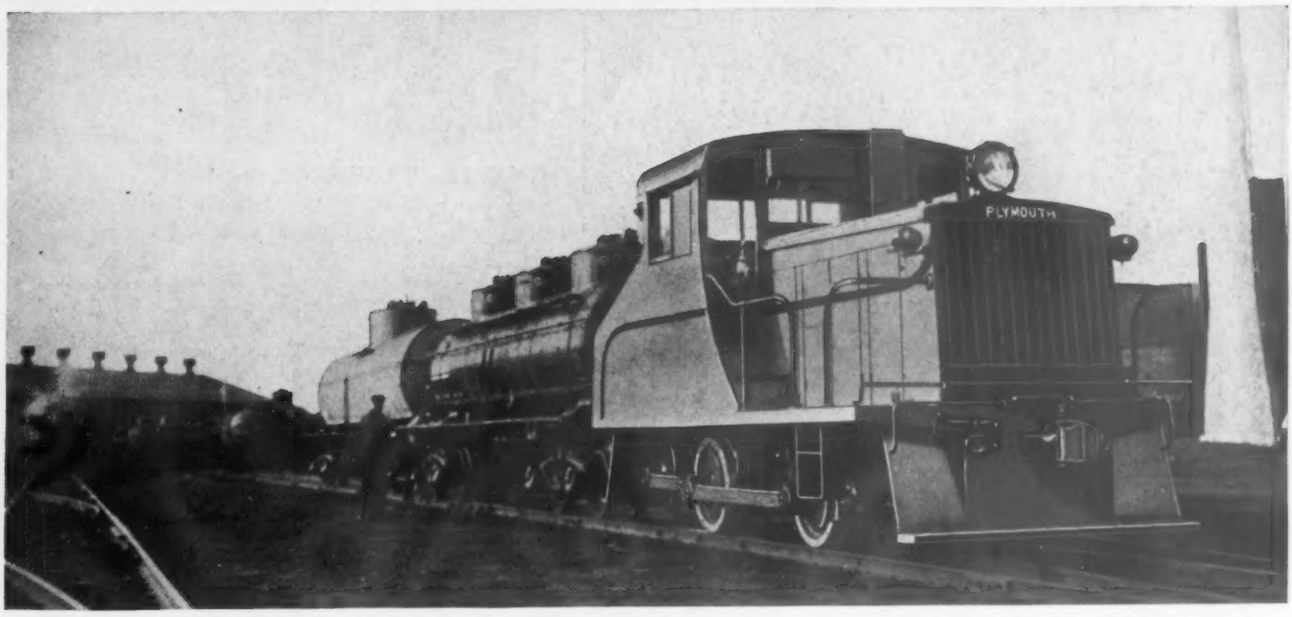

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FIFTEEN THOUSAND HOURS of service background. Twenty-four hours per day, seven days per week, five months of CONTINUOUS PERFORMANCE on one job—with NO TROUBLE or MAINTENANCE on the Flexomotive Drive. Availability 98%.

In addition to this record, the Plymouth Flexomotive is covered by an unqualified written guarantee not offered by any other locomotive builder. Flexomotive is the most ruggedly-built internal combustion locomotive in existence. Write for the record!

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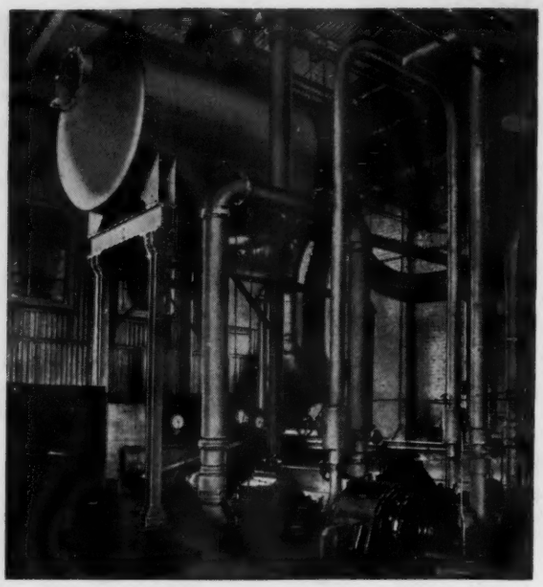
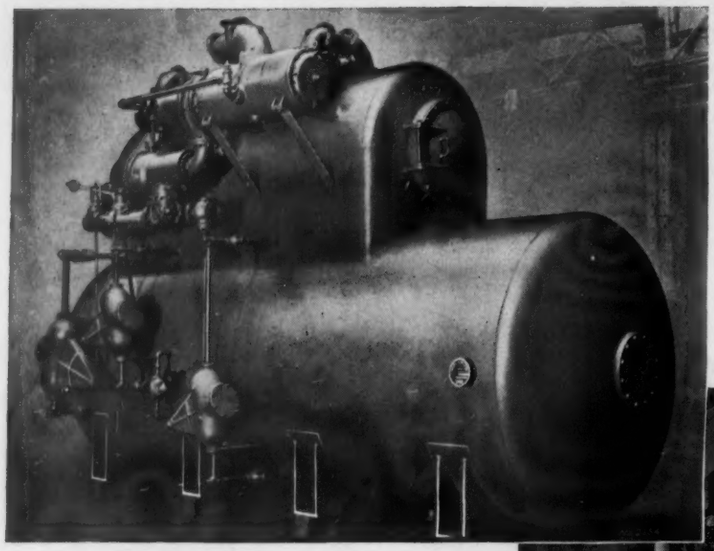
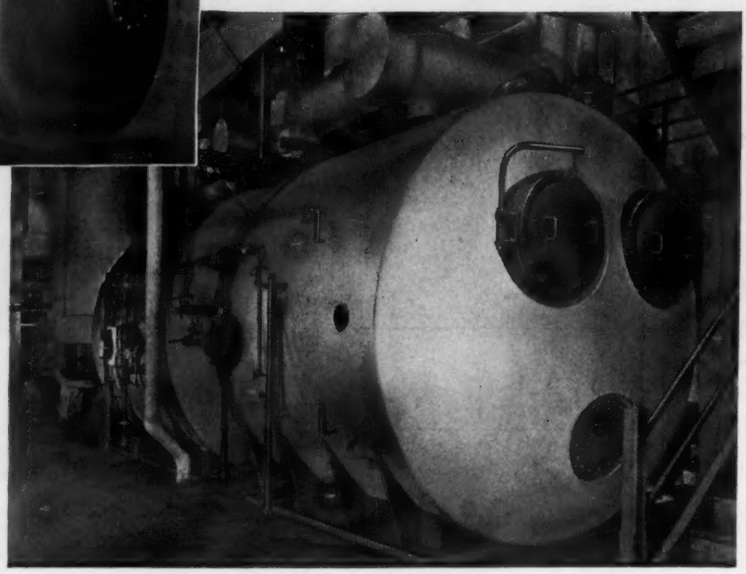


IN A TEXTILE MILL. *This deaerator is for 176,000 lbs. per hour capacity. Note the two Worthington Centrifugal Boiler Feed Pumps for 550 p. s. i.*



IN A MANUFACTURING PLANT. *A 400,000 lbs. per hour capacity pressure-vacuum type storage unit. 7500 gallons storage capacity*



IN A LARGE CENTRAL STATION. *Two deaerators... capacity of each, 650,000 lbs. per hour*

FROM THE SMALLEST INDUSTRIAL PLANT TO THE LARGEST CENTRAL STATION WORTHINGTON DEAERATORS ARE BUILT TO MEET INDIVIDUAL PLANT REQUIREMENTS FOR LIMITED SPACE AND THE MOST EXACTING SERVICE CONDITIONS

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for rotary, trench, conduit service
V-BELT DRIVES LIQUID METERS

They will cut fuel costs by producing the maximum obtainable feedwater temperature. Further, by removing free oxygen and CO_2 they increase boiler efficiency, reduce boiler cleaning and repairs—and prolong the life of both boiler and piping.

Worthington engineers are available to study your feedwater problems. Get in touch with the nearest Worthington district office . . . today

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All Types . . . For Any Capacity

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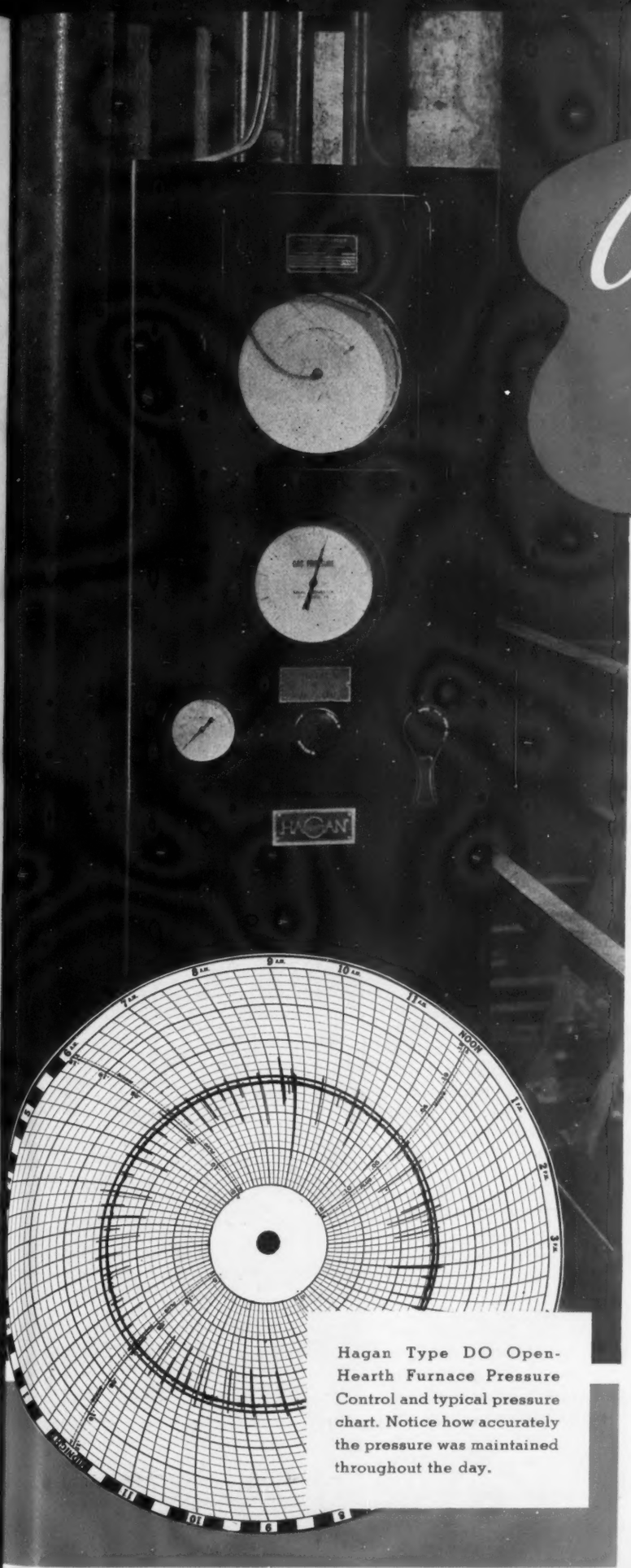

Paid for itself IN 65 DAYS

Hagan Open-Hearth Furnace Pressure Control Saves $13 a Day. Increases tonnage 5%

WHERE can you make a better investment than that? Or earn a quicker return on your money? If you need this control and are not using it, you're paying for it over and over again through increased production costs.

Hagan Automatic Furnace Pressure Control was installed on an open-hearth furnace in a large steel mill in the Pittsburgh district. Tonnage was increased approximately 5% per hour due to more even operation. Savings in fuel alone amounted to more than $13 a day. At this rate the equipment paid for itself in 65 days and in a short time paid for all installation costs. Similar results are being obtained from Hagan Control installations in numerous other mills and can be obtained in yours.

Hagan also makes dependable, accurate control for soaking pits, slab- and billet-heating furnaces and any other applications where the control of furnace pressure, fuel-air ratio and volume are important problems. Our engineers will be glad to look over your mill and make recommendations that will lead to lower production costs. Write or call.

Hagan Type DO Open-Hearth Furnace Pressure Control and typical pressure chart. Notice how accurately the pressure was maintained throughout the day.

Visit the Hagan Display

AT the annual convention of the Association of Iron and Steel Engineers at Pittsburgh and let us show you how to make greater profits through lower production costs.

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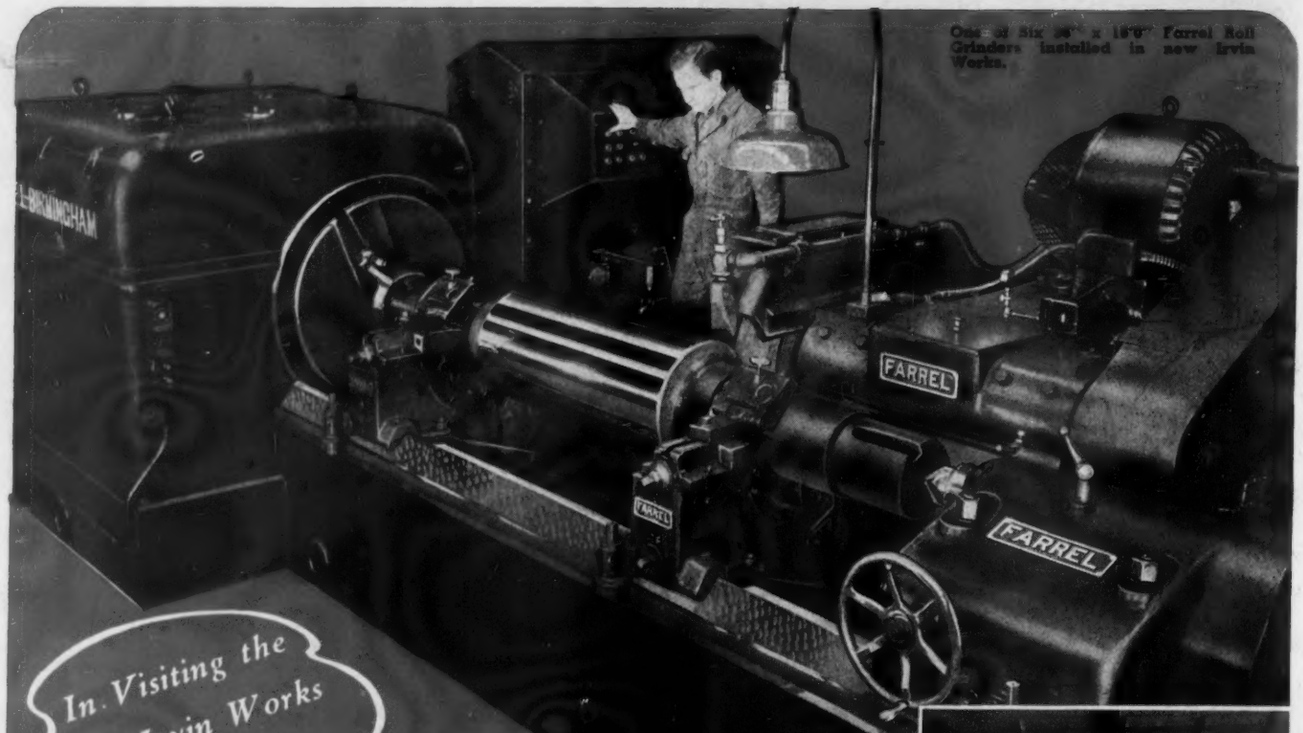
The pioneer . . . and still the leader



One of Six 36" x 18'0" Farrel Roll Grinders installed in new Irvin Works.

In Visiting the New Irvin Works SEE THE . . .

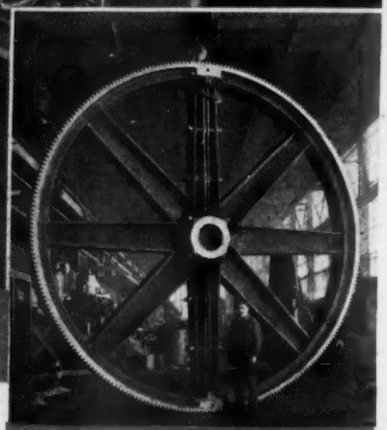
FARREL Heavy Duty Roll Grinders and Drives

The new Irvin Works of Carnegie-Illinois Steel Corporation are to be inspected by visitors to the Iron & Steel Exposition at Pittsburgh. On your tour of this plant don't fail to see the six Farrel Heavy Duty Roll Grinders installed there.

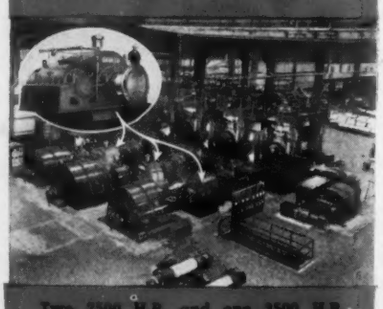
Note the speed and accuracy with which these roll grinders produce rolls of high precision and fine finish; observe how they grind perfect surfaces free from all marks, with either straight, concave or convex contours of exact symmetry. They take, with equal facility, heavy cuts for rough grinding or apply the finest mirror finish. Notice, too, their smooth, vibrationless operation.

You will also be interested to watch the operation of the Farrel Gear Units which drive an 84" three-stand tandem cold reduction mill and 54" reversing mill at the Irvin Works. Typical examples of the advanced engineering and precision construction characteristic of all Farrel Gear Units, these drives are ruggedly built to stand the stresses, shocks and wear incident to high speeds and heavy loads.

Ask our engineers at Booth 71 of the Iron and Steel Exposition to explain the details of design and construction responsible for the efficient, economical, dependable performance of Farrel Roll Grinders and Drives under the severest operating conditions.



Farrel-Sykes Continuous Tooth Herringbone Gear for rolling mill drive, 217.480" diameter, 25" face.



Two 2500 H.P. and one 3500 H.P. Farrel Gear Units driving 84" Tandem Cold Mill in Irvin Works.

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IRON & STEEL EXPOSITION
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FARREL-BIRMINGHAM COMPANY, Inc.

Ansonia, Conn. · Branch Offices: Buffalo, New York, Pittsburgh, Akron, Chicago, Los Angeles

Hardening Gear Teeth

(*Concluded from Page 66*)

the forgings in the untreated state, rough machine, heat treat to desired core condition and then finish machine, cut teeth and surface harden. This procedure is not absolutely essential, however, as satisfactory results can be obtained when heat treated before machining.

Steel castings to be flame hardened should have 1 to 1.5 per cent manganese and a carbon content around 0.35 per cent. The casting purchase specification should read "Analysis suitable for surface hardening." Preferably the supplier gives the castings the preliminary heat treatment to produce a core structure and hardness comparable to those described for forgings.

Since superficial heat treatment may cause hardness to vary widely from surface to core, it is recommended that rough forgings or castings be checked for hardness and the test repeated after the gear blank has been turned.

Quenching Important

Quenching immediately after passage of the flame is important. An adjustment is provided on the machine so the water quenching streams may be located as close to or as far away from the heating point as desired. In flame hardening SAE 4640 or other oil-hardening steels, the water quench may be omitted because of the substantial self-quenching effect caused by the rapid transfer of surface heat to interior of the steel. To accelerate this effect and to insure uniformity of quenching, nonadjacent teeth may be hardened successively using water streams on the gear some distance away from the tooth being hardened.

Hardness obtained ranges from 55 to 57 Rockwell, or 550 to 600 brinell. Penetration ordinarily is about 1/16-inch or greater. This varies, of course, with pitch of the gear teeth.

In gear manufacture, flame hardening appears to have several definite advantages over case hardening or nitriding. On larger sizes of gears, the lower cost and freedom from distortion appear to be the outstanding advantages of the flame-hardening process. On the machine described, gears of 120-inch pitch diameter and 16-inch face width have been hardened successfully. A large and continuously increasing percentage of all spiral, bevel and hypoid gears and pinions cut on planing-generating machines have the teeth subsequently flame hardened.

In addition to the larger sizes where the advantages of flame hardening are most obvious, an increasing number of smaller gears is being processed in this manner. Gears of 10 diametral pitch are hardened regularly, and on several occasions gear with even finer pitches have been flame hardened. Quality and type of gear must be considered in arriving at practical minimum limits. There is a definite field for flame-hardened gears in machine tool work where gear surfaces must be made to extremely close limits. Some machine tool gears already are made to a 0.0002-inch eccentricity tolerance.

Already flame hardening has become an important factor in the gear field, and it is expected to see increased acceptance as manufacturers become more familiar with its possibilities.

•

Buell Open-Hearth Trilogy Is Complete

■ *The Open Hearth Furnace*, Vol. III, by William C. Buell, Jr.; cloth, 308 pages, 6 x 9 inches; published by Penton Publishing Co., Cleveland; supplied by STEEL, Cleveland, for $4.

Third in the trilogy of the open-hearth furnace, this volume is devoted to a comparison of the ancillary systems of selected open-hearth furnaces and the development of basic design principles; checkerwork and recuperative and regenerative effects therein; flues, valves and waste-heat boilers. It follows naturally the two preceding volumes and completes the intimate study of this great instrument of steel production.

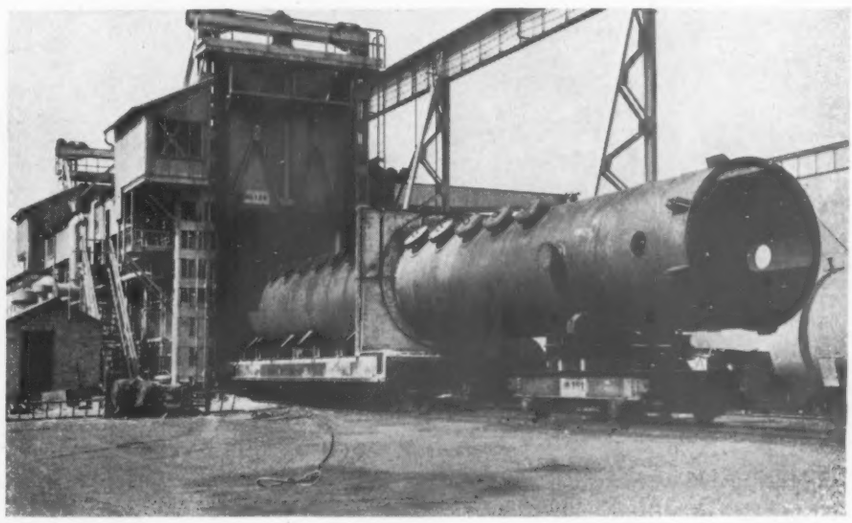
The author states: "For the benefit of the engineer, whether for use as a basis of design, redesign or further research, all data pertaining to the correct inclusion of all the materials commonly employed in the structure, as well as those necessary for the estimation of thermal reactions resulting from the carrying out of the process and the development of correct flow lines have been included, with the underlying idea of causing it to be unnecessary to look beyond the limits of these works for any of the essential information necessary to design or research."

Wherever possible all data have been evaluated into money terms with the fundamental idea of causing the operator, engineer and researcher to become cost conscious.

This volume is devoted to the several components of the furnace system that are located below the charging floor, slag pockets, fantails, regenerators and checkerwork and the flues. It also discusses auxiliary apparatus, such as reversing valves and waste-heat boilers. In addition a chapter is included on furnace control.

In a summary chapter an effort is made to indicate the total worth of the economy as developed by analyses throughout the entire work. The summated results show surprising figures. All tables, equations and illustrations in the three volumes have been indexed for ready reference at the end of this volume.

Stress Relieving Is a Two-Heat Operation



■ **Being 94½ feet long, this welded steel refinery tower was stress relieved in two heats, first one end then the other, in the 80-foot furnace in the Birmingham, Ala., plant of the Chicago Bridge & Iron Co. The tower, 8 feet in diameter, is fabricated from 1½-inch thick A-70 firebox quality steel. The furnace was described in STEEL for Nov. 14, 1938, page 67**

Simplification

A radically different and much simplified design cuts delivery of special unit from 18 months to 9 weeks and saves $9,136. Welded unit also handles wider range of work, has other important advantages

By **JOHN THOMSON**
Works Director
Sir Wm. Arrol & Co. Ltd.
Bridgeton, Glasgow
S. E. Scotland

■ WHILE USE of welded parts offers great economy in production work, possibly it is yet more important when a machine has to be made on short notice for a special job and when only one of each part may be required.

An excellent example of this was encountered in the manufacture of the tower crane used in shipyards and illustrated in Fig. 1. These units consist essentially of a fixed tower structure with a rotating mast and jib. The rotating portion is supported on a footstep bearing at the bottom of the mast and is guided at the top with rollers which contact a vertical path about 14 feet in diameter. This path is incorporated in the platform structure at top of tower. Platform has an external diameter of about 20 feet. It is necessary to machine this path after it has been riveted to the completed platform structure, requiring a lathe or boring mill of sufficient size to accommodate work up to 20 feet in diameter.

Standard Boring Mill Expensive

With orders for eight of these cranes for a naval dockyard on hand and the boring mill previously used to machine the paths fully occupied with work of national importance for two years ahead, it was necessary to develop some other means of machining these units. Cost of a standard vertical boring mill of 20-foot capacity was $58,320 and delivery required 2½ years. Required delivery on the towers made this proposition useless. A simpler machine was considered, but even delivery for that required two years and cost was $14,580.

These were the circumstances which led to the decision to design and make in our own works an all-welded machine. Results exceeded expectations. The machine actually was in operation in nine weeks after start of the design. Time required to machine a path compares favorably with that taken previously by the standard boring mill and the finish of the machined surface is equally good.

Total cost of the welded machine was $3742.20.

Saves Money

In view of this extremely low cost, inquiries were sent out to other machine builders. Quotations ran about $12,150 not including electric drives and foundation which cost $729 additional making total $12,879. This price included an overhead bridge which was essential for standard boring mill operation but not required for the welded design. The bridge, however does make the machine of more general utility so a welded bridge was constructed for the welded machine at an estimated additional cost of $1458. This makes total cost of the welded machine $5200. This unit does all work equally as well as the $12,879 machine. In addition, it required only nine weeks to build compared with absolute minimum of 18 months for other units.

The welded machine consists essentially of a table rotating in a horizontal plane about 1 inch above the floor level. Driving power is provided by 25-horsepower electric motor through reduction gears to a rack welded to the underside of the

From paper receiving first award, $712.28, in metal cutting division of functional machinery classification of the $200,000 Program sponsored by James F. Lincoln Arc Welding Foundation, Cleveland.

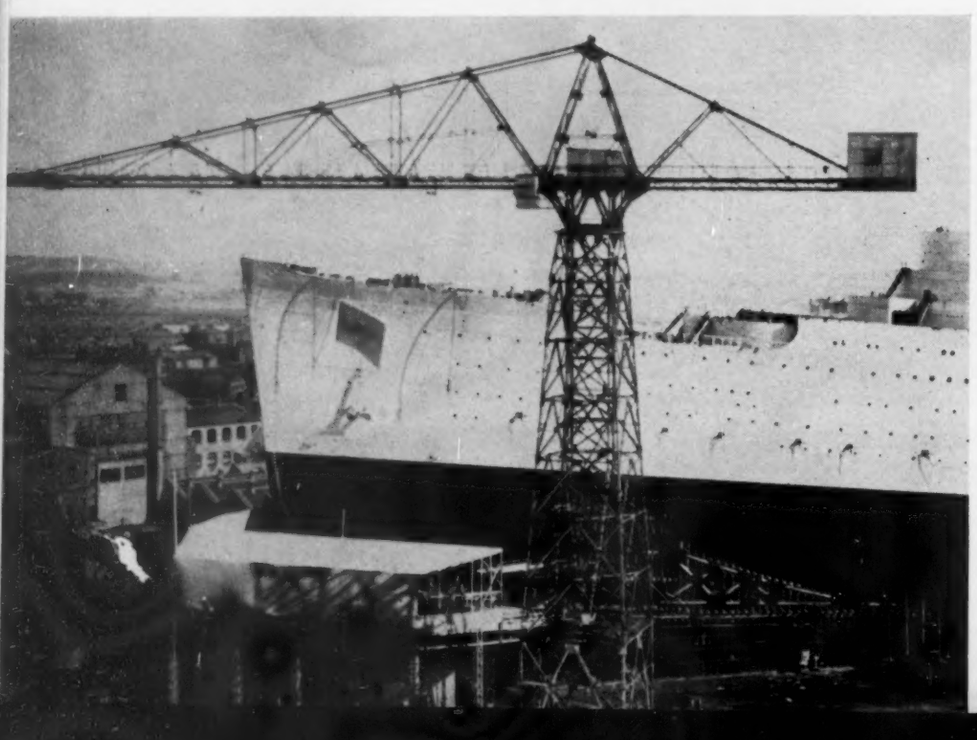
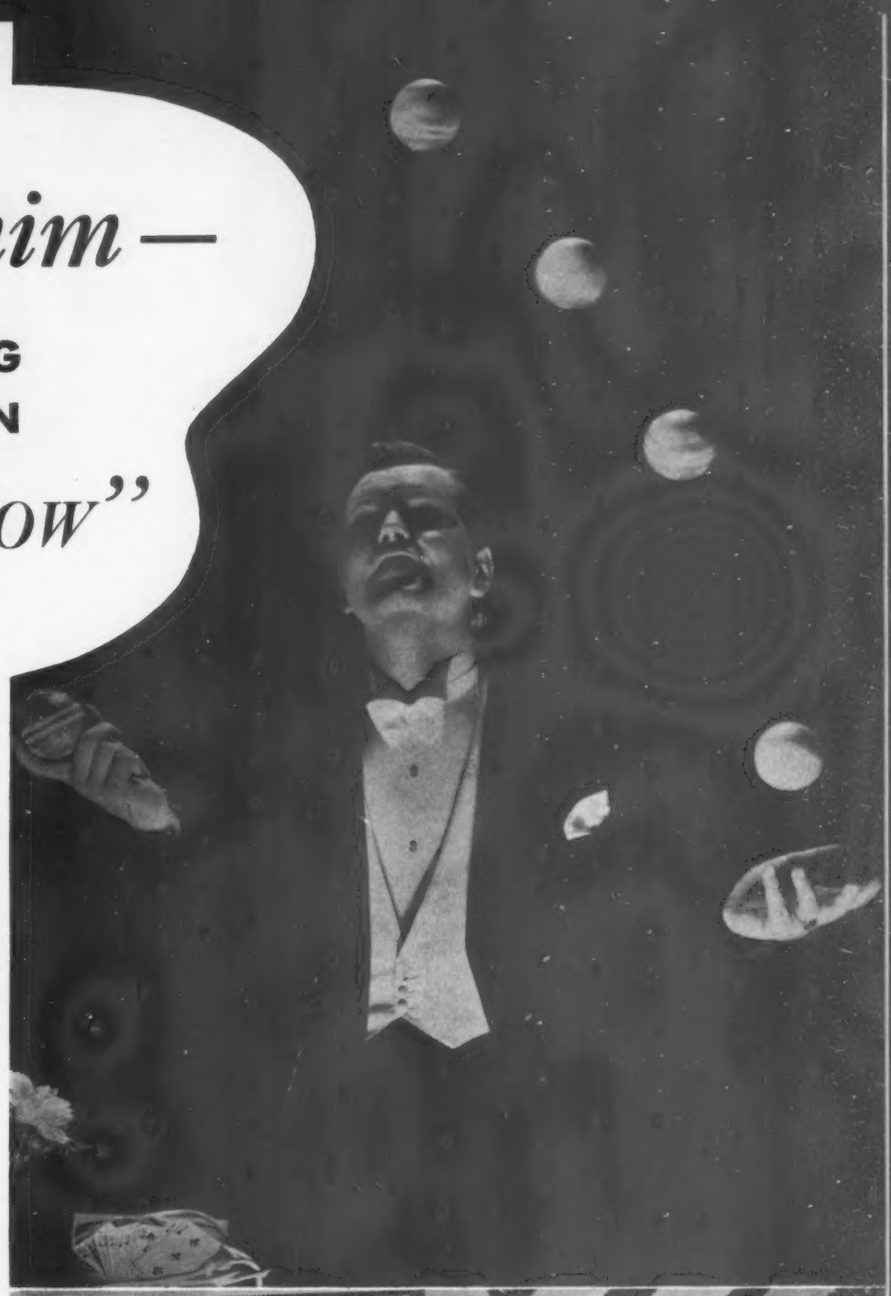


Fig. 1—Tower crane used in shipyards. type of machines made by welded unit described here

It's easy for him—

BUT LIKE EVERYTHING ELSE THE SECRET IS IN

"KNOWING HOW"



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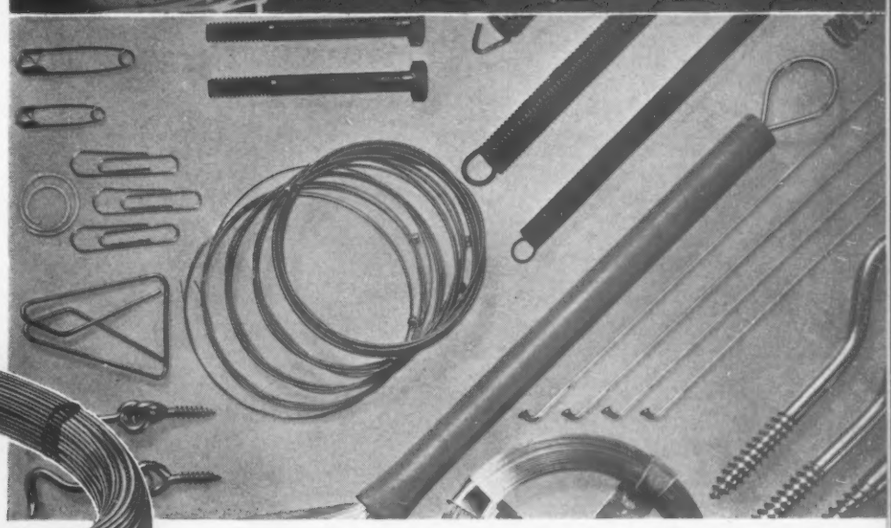

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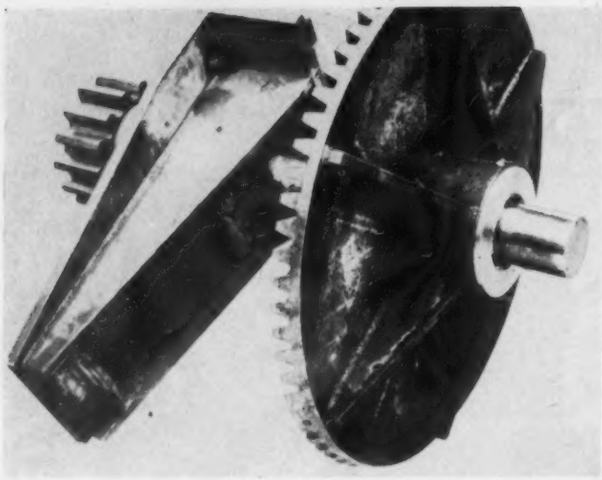


Fig. 2—Wheel with bracket and pinion

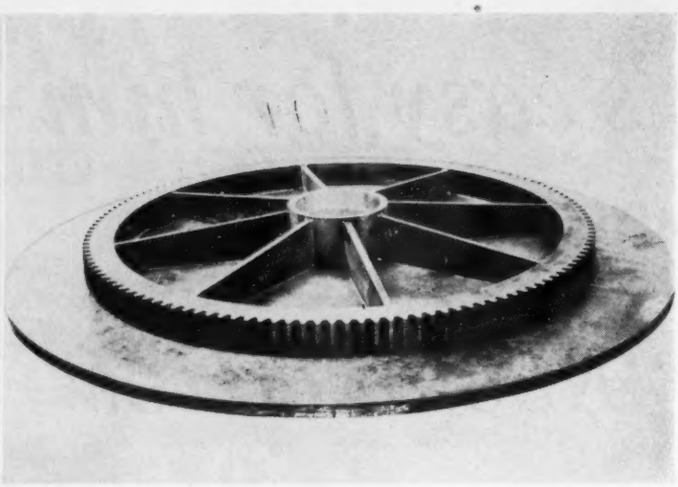


Fig. 3—The complete table unit

table. On the floor surrounding the table, radial beams are grouted into the concrete. When machining paths, the work is bolted to these radial beams and the toolholder bolted to and rotated with the table as shown in Fig. 4.

Thus outside dimensions of the work to be handled are limited only by the floor space available, while internal diameters to be machined are limited only by the length which toolholder can safely overhang the table. In machining external surfaces of smaller work, the job is fixed to and rotates with the table, while the toolholder is attached to the radial arms on the floor.

Floor Space Utilized

Another important feature of the welded machine is that the entire unit is at or below floor level. Thus when machine is not in use, the floor is available for assembly work —an important consideration in this case. The overhead bridge is removable, as many jobs can be handled efficiently without it.

Table consists of a rolled plate 10 feet in diameter and 2 inches thick to which is welded the slipper path and also the housing for the center ball bearing. Outside face of slipper path is gear cut to form the rack for rotating the table. Slipper path and center housing are connected with radial arms which also stiffen the plate. Lower slipper path is grouted in concrete after being machined on the top surface. Cast iron packings are bolted to this path and carefully trued up by hand scraping. Lubrication of the sliding face is provided by rollers running in oil recesses in these cast iron packings.

The electric motor has cone pulleys to afford a variety of speeds. The first gear reduction consists of a standard enclosed worm gear. Second reduction, which also changes the direction of the drive, consists of a bevel pinion gearing into a bevel wheel. The third reduction is formed by the steel pinion gearing into the rack billet. The two pinions were cut from solid forged bars but the bevel wheel and all brackets supporting the gearing are welded.

In fabricating the rotating table, it first was cut to shape with an oxyacetylene torch and carefully flattened in a hydraulic press. Upper slipper path was formed of rolled square billets bent into two semicircles and the ends welded together to form a circle. Full strength welds to connect the two halves together were not necessary as subsequent welding of path-to-table plate was adequate to transmit the driving load on the teeth. Consequently welds were small—just sufficient to hold parts together rigidly during machining and gear cutting. After welding, the ring was machined on all faces and teeth forming the rack were cut on the outside face. This completed unit is shown in Fig. 3.

The cylindrical housing for the ball bearing was formed from a rolled steel plate, 2 inches thick, bent in a hydraulic press to cylindrical form and the longitudinal joint welded. All faces of the cylinder then were rough machined. Radial stiffening plates were cut to shape by a torch.

Slipper Path Machined

In assembling the table unit, the ball-bearing housing first was welded central on the table plate, after which the radial stiffening plates were welded in position. This assembly was placed in a lathe and the outer ends of the radial plate machined to exact diameter of inside of slipper track ring. At same setting, the table plate was machined on slipper path to give a true seating. This machining was advisable as no distortion in the rack teeth could be tolerated when the slipper path was welded in position. For the same reason, final welding of slipper path to table was made using small beads.

These precautions proved effective

(*Please turn to Page* 129)

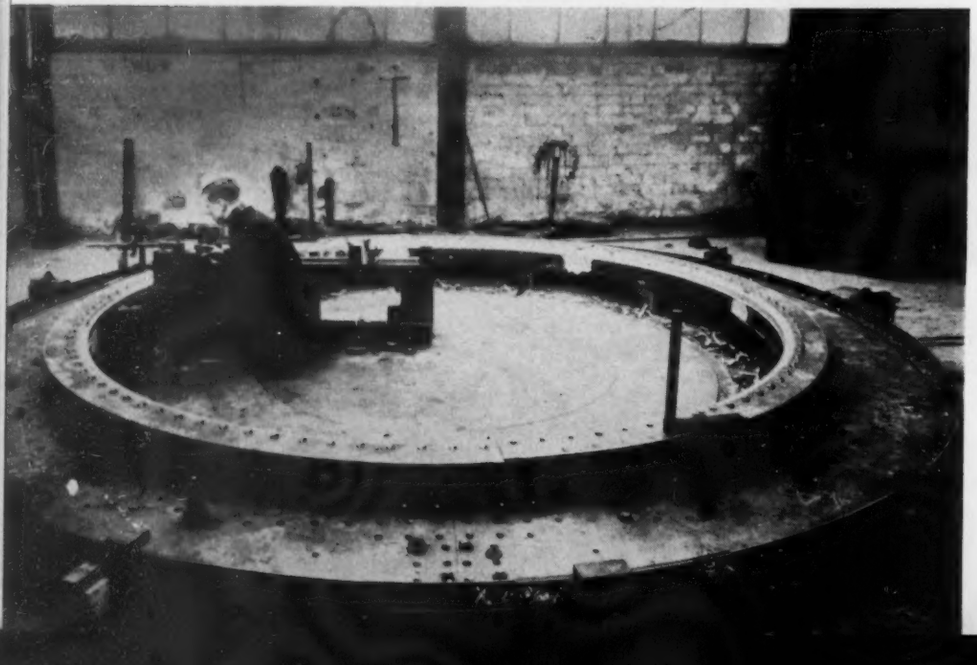


Fig. 4—Work bolted to radial beams with toolholder bolted to table

UNIQUE LINK-BELT COAL STORAGE AND RECLAIMING SYSTEM CUTS COSTS AT

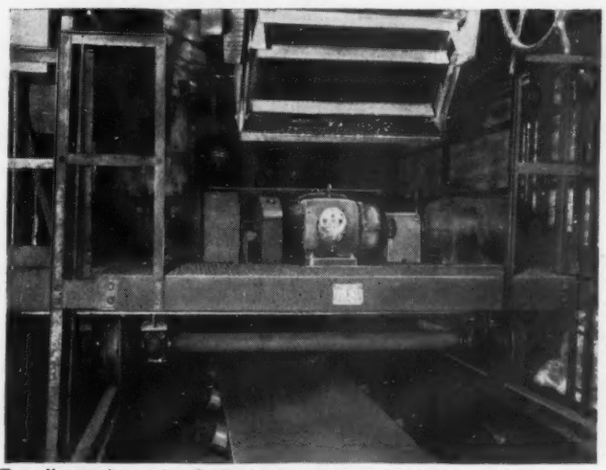
Great Lakes Steel Corp.

● Complete system — three standard Speed-o-Matic cranes, belt conveyors, traveling reclaiming hoppers, a traveling reciprocating feeder, and a portable stacker-conveyor — designed and built by Link-Belt. It provides a flexible, low-cost method of handling coal from self-unloading lake vessels direct to plant or to storage piles or from storage to plant, as desired.

Left: One of three K-480 Speed-o-Matic Diesel cranes equipped with 3-ton-capacity bucket on 60-ft. boom, for reclaiming coal from storage to traveling hoppers, one of which is shown here. There are two of these hoppers, each of which is equipped with a feeder and loading chute. They feed to the reversible, anti-friction belt conveyor, shown in foreground.

Below: Rear view of 180° revolving, traveling stacker for delivering coal to storage, at rate of 600 tons per hour. This view shows tail-boom-conveyor which can be lowered to receive feed from tripper of belt conveyor in the trench; thence to the stacker belt conveyor to storage. Tail-boom is raised, as shown, to permit clearance underneath for tripper travel, when coal is being reclaimed from storage, through reclaiming hopper and trench conveyor.

Another view of two of the three K-480 Speed-o-Matic Diesel cranes. Average reclaiming capacity 500 tons per hour for each crane.



Traveling reciprocating feeder in tunnel beneath 7000-ton capacity storage bin at dock front. Coal is fed from bin through special undercut gates to this feeder car. The 7000-ton bin is filled by conveyor-booms from self-unloading vessels. This is rear view of feeder car showing P.I.V. Gear variable speed transmission which controls feeder capacity rate.

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Metals Industry Benefits Heavily From Electrochemical Processes

■ RAPIDLY increasing importance of electrochemistry in the metalworking field was emphasized at the seventy-sixth meeting of the Electrochemical society in New York, Sept. 10-13. It was pointed out that electrochemistry has made it possible to handle materials not workable by other means and has cheapened production of many other products of wide application. Aluminum, magnesium, sodium, calcium, calcium carbide, high grade ferrochromium, silicon, cyanamid and carborundum are products commercially possible only through electrothermal processes. Among recent developments is the electric smelting of many metallic ores and, of course, nickel, zinc, lead, silver, gold and iron, now are available in commercial quantities through electrochemical processes.

Number of electric furnaces in use in the United States has increased in the last decade to over 1000 with one steel company alone operating six 5-ton, one 7-ton and two 15-ton furnaces. It was stated that the outstanding advance of electrothermics in the past few years has been in the heat treatment of steel where accurate control of temperature is important.

Acheson Medal Presented

One of the principal events of the four-day program was the presentation of the 1939 Edward Goodrich Acheson medal and prize of $1000 to Dr. Francis C. Frary, director of research, Aluminum Co. of America, Pittsburgh. Award was made to Dr. Frary for his contributions to electrometallurgy including his work in perfecting the process for the electrolytic refining of aluminum. Accepting the award, he reviewed his experience in electrochemistry.

Prof. Bradley Stoughton, Lehigh university, Bethlehem, Pa., delivered the sixth Joseph W. Richards Memorial lecture, his subject being "Modern Marvels of Electrometallurgy."

Dr. Stoughton pointed out that pig iron may be produced with electric heat in competition with coke melting furnaces where coke is expensive and electric energy relatively cheap. Based on coke at $15 a ton and electric power at 1/3-cent per kilowatt-hour, blast furnace smelting of pig iron would cost $14.25 per ton compared with $12.17 for iron produced electrically. He figured 1900 pounds of coke for the former process. Reduction by the latter method would take 800 pounds of coke for chemical purposes only at a cost of $6 along with 1850 kilowatt hours of power at $6.17, or a total of $12.17. Swedes probably have done the most in developing the electrical method, he said.

Discussing steel production in electric furnaces, he noted a tendency to increase capacity of the high-frequency type from 1000 pounds to 4 to 8 tons. Eight-ton furnaces are the largest in operation but 15-ton jobs have been built, he said. There is a tendency to reduce the size of arc-type furnaces from 100 tons to about 40 tons. One of the most recent metallurgical developments is proof that strong agitation of the bath under a viscous and "inclusion-absorbing" slag produces extremely clean steel of high quality.

Furnaces for Stainless

Both arc and high-frequency induction furnaces are used in producing stainless steel, he said. Arc furnaces probably are about $1 a ton cheaper in cost of energy expended, but this introduces difficulties in oxidation of chromium which must be reduced back from the slag by means of silicon or aluminum, and by dangers in absorption of hydrogen by the metal, especially if the chromium is not high or if silicon is present.

The induction furnace, he said, usually oxidizes costly alloying elements to a lesser extent. These include chromium, titanium, etc. This type of furnace also has a great advantage in controlled circulation of the bath. For reclaiming stainless scrap, he said, one large American company uses a duplex process consisting of an arc furnace in combination with an induction furnace, not of the high-frequency type, but of low frequency with magnetic core. This avoids hydrogen absorption and enables stainless of low carbon content to be made easily.

Francis C. Frary
Recipient of Acheson medal of Electrochemical society

Constant research is producing annually new and better aluminum alloys for wrought and casting purposes, Dr. Stoughton said. Joseph W. Richards prophesied discovery of a process, probably sometime in the neighborhood or after the middle of this century, by means of which aluminum might be produced at a cost of 5 to 10 cents per pound. Realization of this dream would doubtless make aluminum the most important of all metals available to man, the speaker said.

Price of beryllium has been reduced in ten years by 90 per cent of itself and indications are it will go lower, he predicted. The present predominant process produces beryllium oxide from beryl, then converts this to beryllium chloride and electrolyzes it in a molten bath to metallic beryllium or beryllium alloys. Recent innovations involve production of beryllium chloride directly from beryl and reduction to beryllium or beryllium compounds by an electrothermic process in which the temperature of 1250 degrees Cent. is not exceeded and is less costly. Research has proved that important alloys of nickel and beryllium can be produced; that beryllium is an important addition to stainless and alloy steels with resulting tensile strengths ranging up to 300,000 pounds per square inch and that alloys of magnesium and beryllium can be made. If the price can be reduced, the speaker declared, beryllium bids fair to play a most important part in deoxidizing and desulphurizing of steel and other metals.

Cost of Magnesium Lower

He also pointed out that magnesium has been reduced sharply in price so that the cost of strong magnesium alloys is almost the same as that of strong aluminum-copper alloys.

Cost of producing manganese electrolytically from low-grade domestic ores has been reduced as result of development of a new lead-tin-cobalt electrode by Prof. Colin G. Fink, Columbia University, New York, and Morris Kolodney, College of the City of New York.

Domestic ore may be successfully leached to yield solutions from which manganese may be deposited but cost of production is the chief deterrent to development of the electrowinning process. In a process devised by the bureau of mines, lead or antimonial-lead anodes were used but it was found that for every 100

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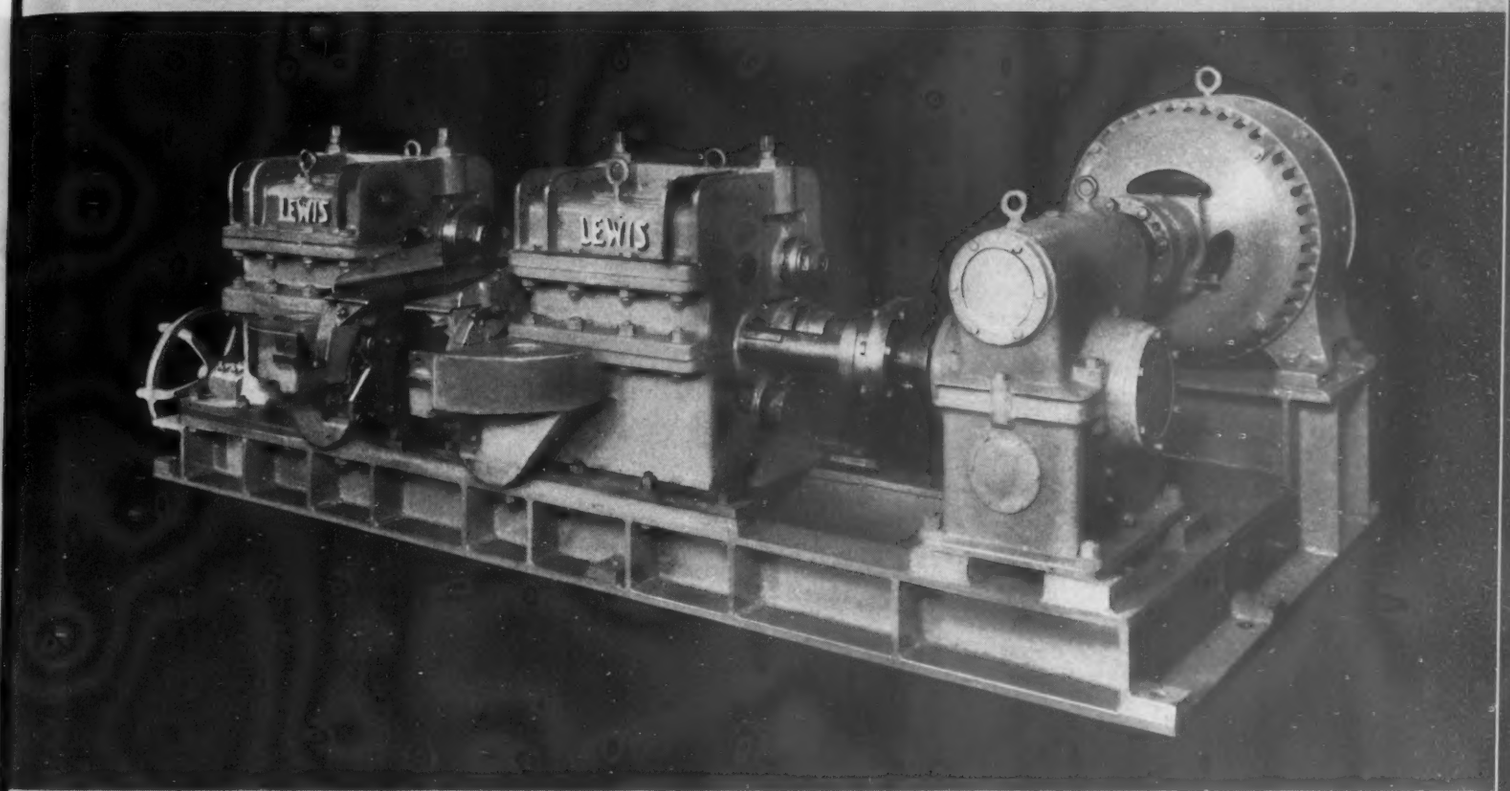

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pounds of metal deposited at the cathode 60 to 100 pounds of hydrated manganese dioxide had to be filtered from the anolyte, washed, roasted and leached again.

In their paper on the new lead-tin-cobalt electrode, the authors said it eliminated electrolyte contamination and necessity of recycling manganese dioxide. Also, the omission of cell diaphragms becomes possible if the anodes are employed in an acid electrolyte. Composition of the anode is: 30 to 50 per cent tin, 0.3 to 0.4 per cent cobalt, balance lead. It was pointed out that with this process, it is not necessary to strip the manganese from a steel cathode, since the manganese can be deposited until the desired average composition is reached. The entire cathode may be melted to produce ferromanganese. In a similar fashion, master alloys for manganese bronze may be prepared by employing a copper starting sheet.

Magnesium Output at Peak

A number of new high-strength magnesium alloys have been developed, Dr. A. W. Winston, chief metallurgist, Dow Chemical Co., Midland, Mich., reported. An advantage of these alloys is their ability to resist corrosion. About 2000 tons of magnesium, or 10 per cent of the world's output, now is being produced in this country, a new high level, he added.

Several papers were presented on corrosion resistance of iron and steel under varying conditions. It has been well established that many types of corrosion are electrochemical.

Sven Brennert, engineer, Stockholm, Sweden, showed that an oxide film on the surface is the active cathode area in the rusting of iron. This is in contrast to the earlier conception of rust which held that impurities on the surface of commercial iron, such as graphite and carbide, act as the cathode areas.

H. E. Haring and R. B. Gibney, Bell Telephone Laboratories, Summit, N. J., presented results of a study on the corrosion protective values on iron and steel of approximately 50 different paints electrochemically. This method requires 24 hours or less, and the results compare favorably with those obtained in one year outdoor exposure tests. Several pigments, including red lead and sublimed blue lead, displayed excellent protective properties, the authors reported.

National bureau of standards has made a study of the rate of corrosion of steel in various types of soil. A paper by I. A. Denison and R. B. Darnielle of the bureau, pointed out that the rate of corrosion under many soil conditions appears to be controlled chiefly by the rate at which hydrogen is depolarized or otherwise removed from the cathodic areas. In specially-designed corrosion cells, it was observed that the most characteristic development in the soil study was the formation of a dense membrane between the anode and the cathode. A probable relation between the membrane formation and the rate of corrosion was suggested.

It is well known that galvanized steel pipe used for hot water lines corrodes rapidly, it was stated in a paper by Gerhard Schikorr, Staatliches Material Prufungsamt, Berlin-Dahlem, Germany. The attack is generally severe in certain areas of the inner surface of the pipe and, therefore, may result in perforation and failure within a year. In view of the present-day high standards of the steel industry, it would seem most improbable that the steel plants are now furnishing steel tubes of lower grade than they did 40 years ago, it was added.

Tests conducted by Mr. Schikorr showed that the zinc in the coating behaved as cathode when submerged in hot tap water. This cathodic behavior of zinc could, in general, be definitely established only at temperatures above 70 degrees Cent., he found. Mr. Schikorr's experiments tend to clarify a number of apparently unusual corrosion phenomena observed in practice with galvanized pipe used in hot water service.

Investigate Silver Plating

A paper on porosity of electrodeposited silver on steel, prepared by Frank C. Mathers, professor of chemistry, Indiana university, Bloomington, Ind., and Lyle I. Gilbertson, assistant professor of chemistry, State College of Washington, Pullman, Wash., set forth that thickness of the plate, roughness of the base metal, and method of applying the silver plate are the important factors.

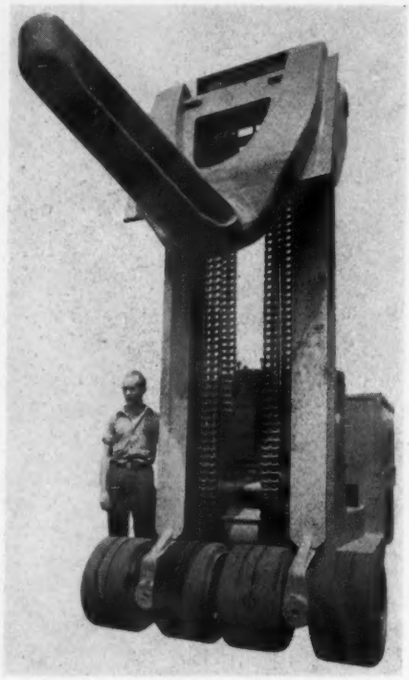
Brush plating, they said, results in greater protection with thinner plate but at a sacrifice of adherence. Use of a silver strike does not affect porosity of brush plated silver on steel. Brush plated steel with 0.0016-0.0040 inch of silver should be suitable for use in fabrication of industrial vessels, it was determined. Brush plated steel with 0.0001-0.0002 inch should be suitable for containers of a temporary nature where great mechanical adherence is not required.

Spring meeting of the society has been scheduled for April 24-27 at Wernersville, Pa. Electric steel and progress in electrodeposition are two subjects which will be given consideration at this meeting.

Lifting Tractor Handles 25,000 Pound Loads

■ A dozen years ago, the average coil of strip weighed 2500 pounds. Today, with triple-welded coils and continuous strip mills, the weight has increased to 25,000 pounds and more.

To handle these coils, Yale & Towne Mfg. Co., 4531 Tacony street, Philadelphia, has developed a ram-type lifting tractor with the strength and flexibility to handle triple-welded coils weighing up to 25,000 pounds. One has already been delivered to a large mid-western mill. Because such a unit must be on constant call and must perform smoothly, swiftly and safely, the tractor incorporates such features as the following: Steel frame with longitudinal girders 1½ inches thick, arc welded to form a single piece of metal. Upright members of 12-inch H-beams, welded to frame.



This giant lifting tractor is powered by either batteries or a gas-electric unit

Tires are 22 x 14 inch, with 56 inches of rubber supporting the load end. Load wheels in pairs have independent articulation for increased stability and safety in operating over rough ground. Each pair is centered under an upright. Lifting is accomplished with two dual alloy steel roller chains.

The giant drive unit is mounted in a massive fifth wheel for complete articulation. Overall height of 148 inches provides a ram height of 15 inches in low position and 100 inches in maximum raised position. Lifting ram is 51 inches long. Overall length of chassis is 141 inches.

Special Refractories Lower Costs In Steel and Nonferrous Fields

■ CONDUCTING its autumn meeting at Conneaut Lake, Pa., Sept. 8-9, the Refractories division, American Ceramic society, confined its attention to special refractories used in the steel and nonferrous industries. Approximately 100 refractories engineers and operating men attended the two sessions, one devoted to steel melting and the other to nonferrous refining and melting.

Two recent developments in special refractories for open hearths were cited by L. A. Smith, Jones & Laughlin Steel Corp., Aliquippa, Pa. One is substitution of plastic chrome for part of the burned-in magnesite to make new bottoms which are claimed to be less expensive and to be safer; and the other is use of magnesite brick hearths at Monessen, Pa.

The open-hearth roof just over the tap hole generally is the point of the earliest costly failure. For years this area of vulnerability included the backwall, but Metalkase brick and sloping backwalls pushed the weak spot up to the skewback and into the adjacent roof, the speaker pointed out.

Extra Cost Returns Dividend

Mr. Smith told of experiments with Metalkase brick eliminating the usual first patch in the roof and backwall. As compared to previous experience he mentioned that this lot of brick, comprising of roof area, 4 x 24 feet averaging 15¾ inches thick and 24 feet of skewback, cost 3.4 times as much as the 20¼-inch thickness of silica brick which it supplanted. In actual money, he explained, the extra cost was about $700, but this returned $3000.

In the speaker's opinion, aluminous brick hasn't much chance of being installed in an open-hearth roof or the front, back and sidewalls.

In discussing superclay brick the speaker mentioned that at his plant a few brick of this type are used for patching small holes in the roof inasmuch as they take thermal shock and last a week or ten days. We can't depend upon the patch lasting much longer, he explained, for it melts and runs around the adjacent silica brick. High-alumina brick have done worthwhile jobs for us, he stated, in certain cooled ports.

The speaker said that sooner or later combustion will be better controlled and ports, slag pockets and checkers can be made to stand up much longer than at present and when this comes, the roof of the open hearth must give a better account of itself. Suspended roofs will bring new refractories in the open hearth because with longer roof life we can afford to put higher-priced special products in the comparatively small vulnerable spots; and this is where the producer of special refractories will come into his own.

Bottoms of electric-arc furnaces should be laid tightly as a precaution against metal cutting through the monolithic hearth. This precaution was brought out by J. H. Chivers, Pittsburgh, in speaking on "Refractory Life in Electric Arc Melting of Steel and Alloys." Brick in sidewalls, he continued, are laid loosely or with expansion joints since silica brick or magnesite brick expand about 3/16-inch per foot at operating temperatures.

One of the most important factors in the construction of the roof advanced by the speaker is to have the proper pitch for any given diameter. The proper amount of expansion also is important.

Superduty fireclay brick, he explained, are used in electric furnace roofs to good advantage. The speaker was of the opinion that one of the main requisites to securing low refractory costs in the electric furnace is use of the proper voltage for each size of furnace. The higher the voltage, the higher refractory cost, he stated.

Another important factor in refractory costs cited is the regulation of slag composition. At times special slags are employed to secure certain specific chemical and physical requirements. In some instances, he explained, we sacrifice refractory cost to secure the desired quality.

Improves Shell Construction

The furnace shell construction also has a bearing on refractory life, Mr. Chivers stated. He mentioned that three 10-ton and one 25-ton units now are operating with cone-shaped shells. The 25-ton furnace is showing a decrease between 25 and 50 percent on refractory costs. This may be due, he said, to sidewalls being further away from the electric arc and may be accounted for by the sloping wall that permits the construction of monolithic lining higher.

Refractory costs for various types of operation vary widely. The 10-ton furnace mentioned has a refractory cost ranging from 50 cents to $3 a ton, he said.

In speaking on "Correlation of Physical and Chemical Properties of Stopper Heads with Open-Hearth Service," J. A. Sarandria, Electro Refractories & Alloys Corp., Buffalo, stressed importance of the following properties:

1. Resistance to abrasion or erosion. This must be high because in the pouring pit a successful stopper head will lose as much as ½-inch on a 6-inch diameter head.
2. Porosity and per cent water absorption. This affects the resistance to spalling and possible penetration of the metal.
3. P.C.E. (pyrometric cone equivalent) or softening point. This must be high enough to the steel temperature so that there is a minimum amount of fusion reaction with the nozzle.
4. Cold firing strength. This should be sufficient to withstand assembling where the stress is concentrated on the bolt hole and shoulder. The nose, too, must resist the ramming action of introducing the plug mix.
5. Load-bearing capacity at steel temperatures should be high because the stopper head must resist the pressure of the ferrostatic head of metal or the manual pressure exerted in making the shut-off. As the head of the metal lowers, pressure due to the weight of the assembly increases.
6. Thermal conductivity properties must produce a rather definite temperature gradient. The stopper head must not allow too rapid a passing of the heat through it, so that it will injure the bolt; and yet be conductive enough to allow the heat to pass through the bolt and rod, so that there will not be a build-up of heat and consequent failure at the outside surface.

Stopper Heads Compared

The speaker presented data on a number of stopper heads of various manufacturers. The per cent water absorption ranged from 9.4 to 17.6 per cent and porosity from 17.9 to 31.1 per cent. He recommended stopper heads having a porosity ranging from 23 to 28 per cent. P. C. E. ranged from cone 11 to 23. Compressive strength varied from 1630 to 3620 pounds per square inch. He cited strengths of 2300 pounds per square inch as satisfactory. Values for tensile strength and assembly. shear stress were in the same relationship as the compressive strength values.

Success or failure of stopper heads does not always depend on the stoppers, Mr. Sarandria contended. The manner in which a stopper head is assembled and dried is important as well as the manner in which it is set in the ladle. Relation of the head to the nozzle also is important.

Composition of the stopper bolt plays a big part, he said, since the melting point of the bolt depends upon the carbon content. The best bolt to use in most cases is one which has a melting point of about

2750 degrees Fahr. and a carbon content of about 0.05 per cent.

Of all the factors involved in the desirable properties of stopper heads, the speaker directed attention to resistance to abrasion, porosity, cold strength and load-bearing capacity as the most important. Of equal importance are the design and size of a head. He stressed the importance of a uniform composition and care in the manufacture of stopper heads and stated that they must be free of manufacturing defects which may cause premature failure.

Carbon bonded silicon carbide retorts are giving promise in the separation of zinc from the lead bullion and iron pots are rapidly being replaced by silicon carbide crucibles which have the advantage of durability and faster and cheaper melting of aluminum and aluminum alloys. This advance was brought out by G. S. Diamond, vice president, Electro Refractories & Alloys Corp., Buffalo, at the nonferrous session.

While fireclay is satisfactory for some aluminum alloys and for some brasses, the speaker directed attention to the fact that silicon carbide is more economical for rapid melting and for resisting mechanical abrasion. He recommended mullite and fused alumina for high lead-copper bearing alloys. The speaker was of the opinion that basic linings (magnesite) for these lead alloys would be ideal if spalling conditions were not so severe.

Alumina Cement Preferred

Wyatt-type furnaces have had good results on yellow brasses when using mullite cement blocks and linings. For more severe service such as nickel-silver, red brass, copper-nickel, etc., fused magnesia cements are popular. In the last few years, the speaker stated, fused alumina cement has been found the best universal cement for Wyatt furnace linings especially when melting silicon-copper alloys, nickel-copper, red brass, nickel-silver and other rich mixtures. The comparatively low cost of fused alumina cement also makes it economical for use in the easier yellow brass field. The use of preformed or prefired blocks has been discontinued by most of the large brass companies in favor of this type cement, Mr. Diamond said.

Speaking on "Use of Refractories in Melting Copper and Copper Alloys in the Ajax-Wyatt Induction Furnace," S. H. Booth, American Brass Co., Ansonia, Conn., stressed the fact that this type of electric furnace is probably the most widely employed means of melting copper alloys for rolling mill purposes in use in the world today. It represents, he asserted, one of the greatest advances in melting these alloys since the introduction of the graphite crucible.

Describing the usual method of starting a furnace, he stressed the importance of preheating the lining with a kerosene torch. Sufficient molten metal is dumped in to fill and cover the slot to a depth of about 2 inches. The charge then is built up by the addition of the necessary metals.

To prevent excessive oxidation of the metal, he suggested that most of the alloys be covered with a layer of charcoal during the melting period which is skimmed off if desired with any dirt or oxide, before pouring. In melting brass alloys the speaker mentioned that the inside surface of the crucible will build up gradually with a deposit of oxides to such an extent that the inside diameter of the crucible will be reduced materially, thus interfering with capacity of the furnace. He cautioned that this should be removed about once a week with an air hammer or long chisel and suggested that molten metal be kept in the furnace to cover the slot and maintain the secondary circuit.

Effect of Permeability

The speaker emphasized the importance of permeability of the refractory. Zinc vapor will sometimes pass through the block to the hole around the primary coil, and there condense, drop on the coil and short it. When melting copper or alloys close to 100 per cent copper, copper oxide frequently will penetrate the block slowly, and gradually building up under the coil, will short it.

Mr. Booth said that refractories incorporating magnesium oxide seem to give excellent results on nickel silver and cupro nickel but experiments with them in melting copper a number of years ago were disappointing. If not already being done, a way will be found to make use of it on this work.

Speaking on "Study of the Effects of Molten Aluminum on Special Refractory Bricks," H. O. Burrows, Aluminum Co. of America, Cleveland, pointed out the tendency of aluminum dross to build up on the furnace walls during melting thereby decreasing capacity. The speaker described recent tests made on various brick for open-hearth furnaces used in aluminum conversion. The brick were installed in an electrically-heated ladle and the vessel filled with molten metal. The metal was maintained at 1400 degrees Fahr. for 35 days. The ladle then was drained and the bricks and debris removed. Test showed that about 3 per cent of the silicon went into solution. In the case of power-pressed magnesite brick containing 2 per cent iron, penetration was greatest on the pressed side. Impregnation was complete in the silicon-carbide brick with the exception of a core in the center. In the case of silica brick, the entire surface was impregnated leaving the top in a warty condition. Tests disclosed that impregnation is a function of the density of the brick. The tendency is for the structure adjacent to the impregnation to spall, the speaker stated in conclusion.

A paper on "Report on Refractories in World's Largest Copper Smelting Furnace" by W. B. Boggs, Noranda Mines Ltd., Noranda, Quebec, described a reverberatory furnace, 25 x 112 feet, will smelt 4000 tons of ore per day. Front and firing walls are built of 60 per cent aluminum brick; sidewalls are of magnesite. The 70-foot arch is built of unburned magnesite brick.

This paper brought out an unique method of constructing the sidewalls. Tin cans in which magnesite ramming material is received are filled with magnesite and sodium silicate and then suspended from eye bolts so they cannot fall into the furnace. The roof is made of chemical bonded impressed magnesite brick inserted in tin cans.

The convertors are lined with unburned magnesite brick and have a life of 1 year. The burned-in magnesite bottom of the anode furnace is made up of prepared magnesite and from 5 to 10 per cent of roll scale.

G. J. Easter, research department, Carborundum Co., Niagara Falls, N. Y., spoke on "High Temperature Chemical Reactions Viewed by Moving Picture Camera."

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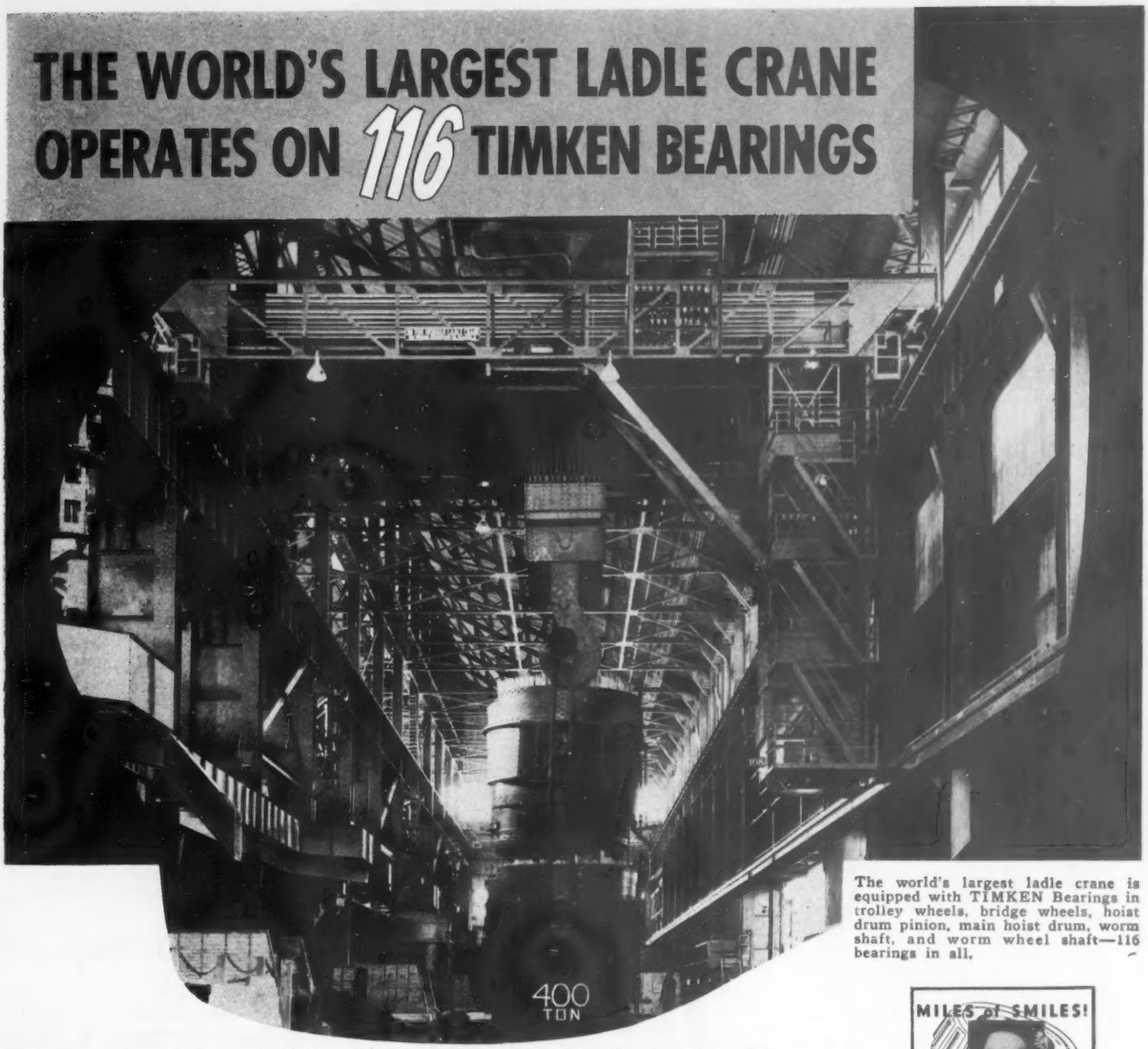
New Alloy Steel

■ Croloy 7, a new alloy steel for elevated temperature service in tubular form, has been developed by Babcock & Wilcox Tube Co., Beaver Falls, Pa. Intermediate in properties between Croloy 5 and Croloy 9, Croloy 7 has a nominal percentage analysis, as follows: Chromium 7.0 per cent, carbon 0.15 per cent maximum, molybdenum 0.45 to 0.65 per cent, silicon 1.0 per cent maximum.

Seals Crank Cases

■ A new crank case sealer which stands immersion in lubricating oils for four hours at 350 degrees Fahr., and which is claimed to be unaffected by Freon, Carrene and other refrigerants is announced by Roxalin Flexible Lacquer Co., Elizabeth, N. J. It does not chip or flake under sharp knocks and severe abrasion, air dries in regular lacquer time and is applied by spraying and slushing. It seals in any sand particles which may remain in castings.

THE WORLD'S LARGEST LADLE CRANE OPERATES ON *116* TIMKEN BEARINGS



The world's largest ladle crane is equipped with TIMKEN Bearings in trolley wheels, bridge wheels, hoist drum pinion, main hoist drum, worm shaft, and worm wheel shaft—116 bearings in all.

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The Morgan Engineering Company, Alliance, Ohio, has put many responsibilities on TIMKEN Bearings in the past, but never before any as heavy as this. Their confidence was not misplaced however.

All through the steel industry, wherever TIMKEN Tapered Bearings are used—on cranes, mill roll necks, pinion stands, run-out tables and other kinds of equipment—you'll find the same story of efficiency, dependability, endurance and economy. Does it pay to use Timken Bearing Equipped machinery? Ask the mill operators!

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

VISIT THE TIMKEN EXHIBIT AT THE IRON AND STEEL SHOW SPACES 68 AND 69

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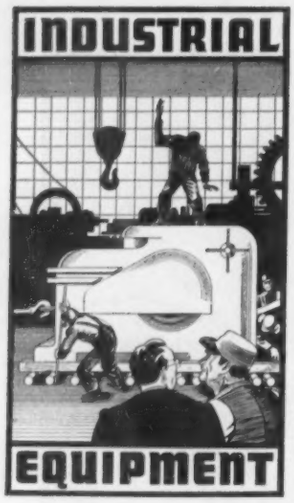


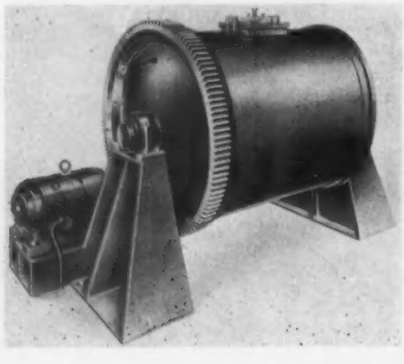
Double-Throw Switches

■ Square D Co., 6060 Rivard street, Detroit, announces double-throw switches made in full Type-A construction having quick make and

break. Cover interlock and padlocking divisions for three padlocks in the "Off" and both "On" positions are provided. Switches are of unit base construction and have the new V-type blade, multi-spring jaws and compression spring. Switches of 60, 100 and 200-ampere sizes, both 2 and 3-pole, are now in production. All sizes are listed with Underwriters' Laboratories for either 230 or 575-volt alternating current as well as 250 volts direct current.

Ball And Pebble Mills

■ H. K. Porter Co., Inc., Forty-Ninth and Harrison streets, Pittsburgh, has established a separate division for the design and manufacture of



many types of processing equipment, including ball and pebble mills, tube mills, agitators, mixers, blenders, autoclaves, kettles, tanks, etc.

All the new Porter mills are mounted on self-aligning roller bearings and are of electrically welded steel construction to support the loads and maintain rigidity. The motor stands are fabricated as an integral unit of the mill stand to avoid misalignment of motor drive and unlined mills are constructed of high-carbon steel with a manganese content of 1.50 to 2.00 per cent having a tensile strength of over 100,000 pounds per square inch and a brinell hardness of between 200 and 250. All mills, up to and including those 36 inches in diameter are made with seamless formed dished heads of the same composition as the mill body. All jacketed mills, whether lined or unlined, have the jacket extending over nearly 100 per cent of the mill surface instead of over a portion of the cylindrical surface.

Flue-Gas Analyzer

■ Hays Corp., Michigan City, Ind., announces Orsatomat automatic flue gas analyzer with tilting analyzing portion of transparent plastic. Case, draft measuring and indicator are pressed steel. Both analyzer and indicator are removable. The instrument employs the principle of volumetric measurement and chemical

absorption. In obtaining analysis of gas, rod protruding from side of case is pulled out, gas is aspirated by rubber bulb and rod then is pushed back in position. Percentage of carbon dioxide then is instantly indicated on dial at front of case. The entire process requires about one half minute. A two-unit model is available for carbon dioxide and oxygen and a special model for testing efficiency of automobile engines. Orsatomat weighs 12 pounds fully charged, and is finished in gray lacquer with chromium trim.

Combination Bin

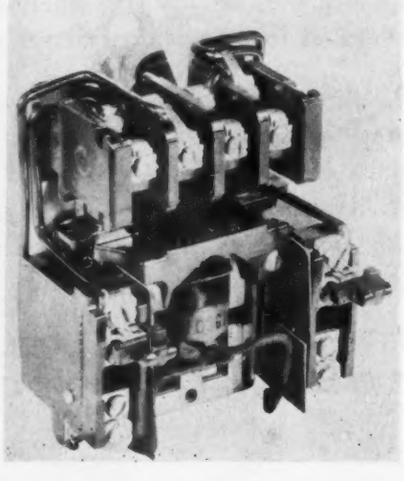
■ Mechanical Handling Systems, Inc., 4700 Nancy avenue, Detroit,

offers Collapsi-Bin for use as shipping container, for interdepartment transit and for storage purposes. Bin is of heavy-duty construction with 8000-pound capacity and frame is of square steel tubing with integral steel plate to form smooth surfaced pallet. Steel tubing corner posts of corrugated steel left and right side panels extend downward to nest inside legs of skid to form rack.

The corrugated steel end panels reinforced with angle steel frame form secure joint with side panel corner posts by self-locking device. Steel pins at bottom of each panel engage holes in skid plate top and frame to anchor each panel at two points between corner pillars. Lugs fastened to corner posts brace end panels and relieve locking device of heavy strains.

Small Magnetic Switch

■ A new Size 0 alternating current magnetic switch made by General Electric Co., Schenectady, N. Y., is available for single-phase motors up to 1 horsepower, 110 volts, and 1½ horsepower, 220 volts. This new switch, while small in size, is built to standard specifications and provide a high degree of protection to operators. Made in 2, 3 and 4-pole forms, the switch is available in



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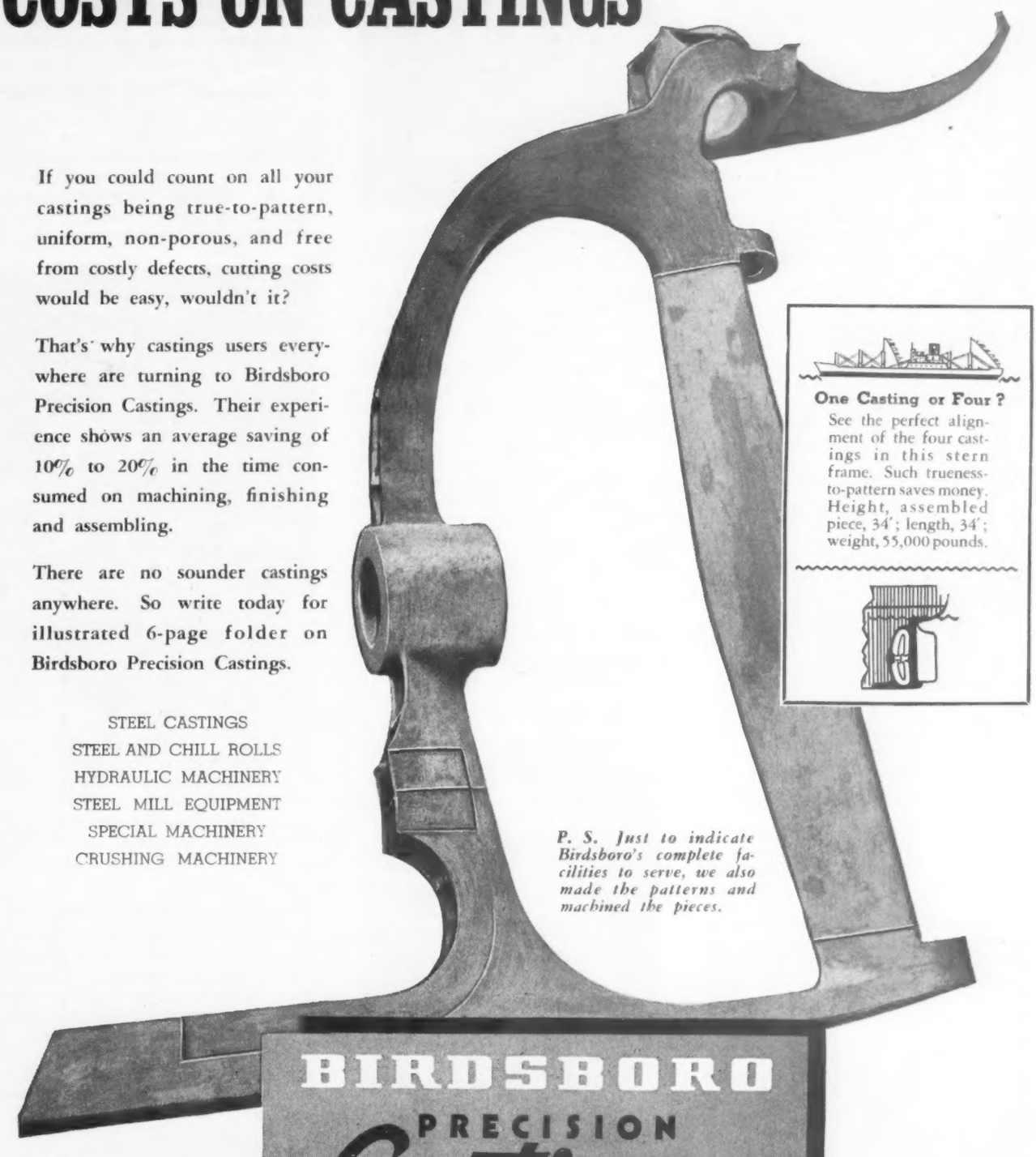

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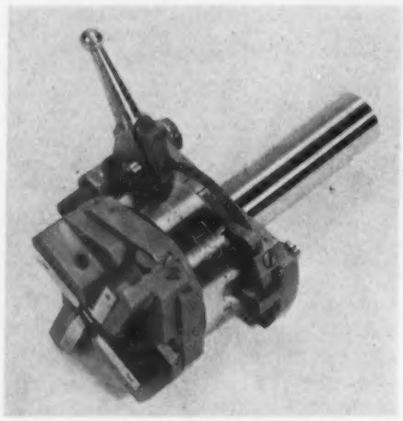
general-purpose, dust-tight and water-tight cases. Forms are also available with a push-button or selector switch in the cover for local operation.

The magnet of the new switch is of the E-type with three sealing surfaces to decrease the hammer blow in closing and to increase the life of the magnet. A new rivet-type built-in pole shader, used only in this line of switches, is a feature. The contacts are double-break, made of fine silver, and are easily removed for inspection or replacement. Isothermic overloads are built with a positioning spring which permits making the relay either hand or automatic reset. A holding interlock is provided and two additional interlocks, either normally open or normally closed, can be added when required.

Die Heads For Hand Screw Machines

■ Jones & Lamson Machine Co., Springfield, Vt., announces 16S and 16SB dies heads. Models 16S illustrated is for use on small hand screw machines and has adjust-

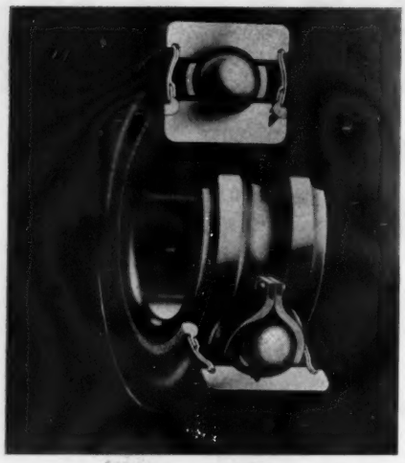


able pull-off and hand locking lever. Model 16SB as external trip and is recommended for use on No. 0 and No. 00 Brown & Sharpe automatics. It cannot open during indexing movement on high speed machines. Both models are of same general construction as J & L tangent dies except for flat type chasers, which, although of flat type, are equivalent in section to tangent chaser.

Both the top and bottom of the chasers are provided with chamfer and top rake. After they become dull on top, they may be turned over, making them equivalent to two sets of ordinary radial type chasers. Chasers are ground in thread form after hardening. Each chaser is secured to chaser-holder by single screw which forces it against two ground surfaces.

Felt-Sealed Bearing

■ SKF Industries, Inc., Front street and Erie avenue, Philadelphia,



offers series 6200 RS Red Seal bearings with double felt seals. Bearings have standard single row SAE dimension of bore, inner and outer race width, which up to the present time has not been possible except through use of small balls and loss of bearing capacity. Conventional stuffing box type seal has been supplanted by air-cleaner principles sealing against dirt by felt fibre contact on polished surfaces of inner race, and by utilization of natural tendency of deflected felt to resume its original flat shape.

Bearing is suitable over a great range of speed. Ample lubricant space is provided. Bearings are available for shafts up to approximately 1 inch in diameter.

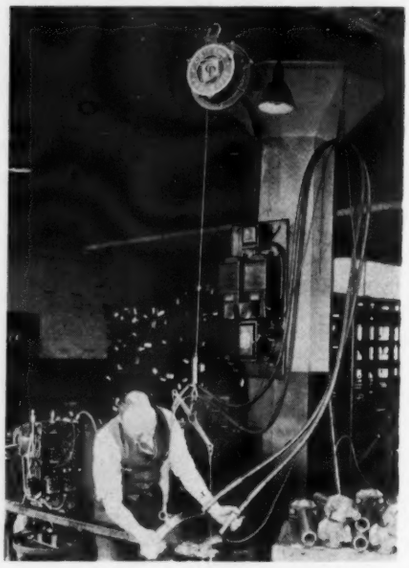
Reduction Crusher

■ Allis-Chalmers Mfg. Co., Milwaukee, announces the type "R" all-steel reduction crusher for handling large tonnages of stone or ore. Although working on the gyratory principle, it operates at a higher speed than ever used before and has a crushing stroke designed for high

capacity and cubically-shaped product. This crusher has the spider and top shell cast integral, readily removable for replacement of its manganese steel concave ring. Adjustment for taking up wear on this liner and on the special manganese steel mantle is accomplished by a hydraulic jack supporting the main shaft, located in the bottom plate of crusher. This jack arrangement also provides product size adjustment and under normal operation firmly holds the head and shaft in position for maintaining a uniform product. A safety valve feature permits automatic adjustment for tramp iron. Dust seals keep working parts clean and bottom plate is of open type to prevent obstruction of crushed material.

Suspended Tool Balancer

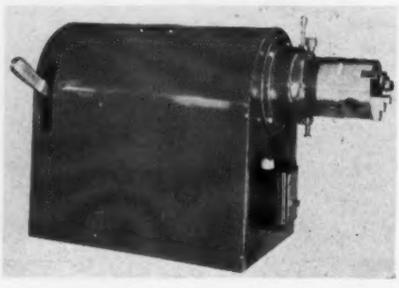
■ Chicago Pneumatic Tool Co., 6 East Forty-Fourth street, New York, offers the CP Super Safety Balancer for lifting, suspending and balancing of portable tools or objects weighing up to 200 pounds. The single cable has a safety factor of



10 to 1 and automatic cable lock prevents overwinding of cable in either direction—up or down. Cable guide keeps cable in line with drum groove and prevents jumping. Both safety hooks furnished as standard equipment are of closed throat or "safety" type.

Variable-Speed Lathe

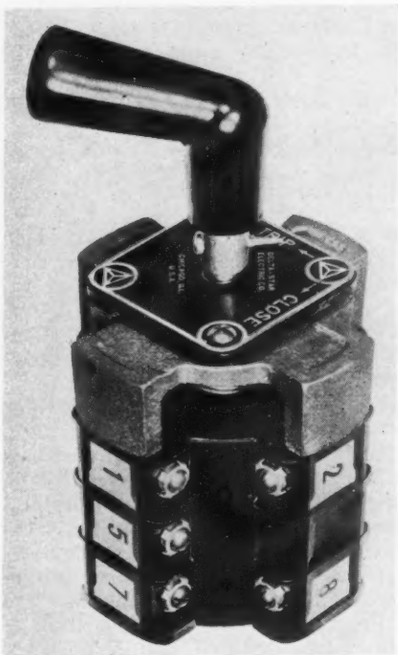
■ Schauer Machine Co., 2060 Reading road, Cincinnati, has added a VA1B variable-speed lathe to its line of Ideal speed lathes which provides a polishing head with infinitely variable spindle speeds ranging from 75 to 6350 revolutions per minute. The speed range is 6.8 to 1 with a single-speed motor and 14 to 1 using a two-



speed motor. It is unnecessary to stop lathes for speed changes. Standard equipment includes an automatic braking system for quickly stopping the spindle and a three-jaw universal chuck for holding the work and a 1-inch clear hole is provided through the spindle. Overall length is 26½ inches, width 11⅛ inches and height 16 3/16 inches. A thermal switch and overload relay is standard electrical equipment on all lathes.

Control Switch

■ Delta-Star Electric Co., 2400 Block Fulton street, Chicago, offers circuit control instrument transfer and signaling switches with right-left, push-pull rotor movements and unit con-



struction with bakelite housings. These units use small amount of space at rear of panels.

Ceiling Reflector

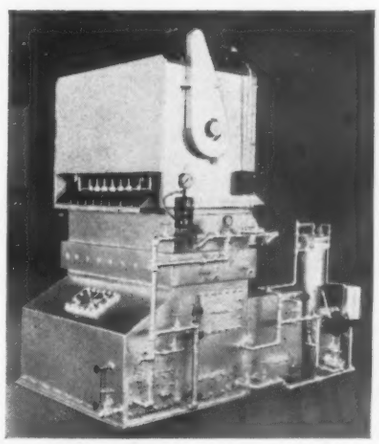
■ Berger Mfg. division, Republic Steel Corp., Canton, O., has developed Parab-O-Lume reflector sections which, installed around and above an indirect lighting fixture, make a parabolic reflector out of the ceiling by flattening out a parabola and transferring its angles of reflection to the flat surface.

This new ceiling unit receives the light rays, bends them and directs them straight downward upon working surfaces. By this method light is efficiently utilized with little waste and higher wattage may be used to obtain still brighter illumination without ceiling glare. Reflectors are made from steel sheets stamped in prismatic design and painted with aluminum paint having a reflection factor of 78 per cent. Tests have

shown that such reflectors are more efficient than a flat white ceiling with a reflection factor of 80 per cent. Reflectors are made in standard sizes of 6 x 6, 8 x 8, 10 x 10 and 12 x 12 feet and are easily installed.

Automatic Degreaser

■ For fully automatic, economical cleaning of cylinder shaped parts, Detroit Rex Products Co., 13005 Hillview avenue, Detroit, has placed on the market 1-dip Detrex Degreaser which can readily be placed in an assembly line and does not require an operator. Conveyor used is two-strand type equipped with pendant fixtures for carrying work to be cleaned. The work is fed to the degreaser 6 units wide from a table equipped with guides, and parts are released by a chain-driven indexed feed mechanism allowing them to roll on fixtures which are rigidly guided in both the loading and un-

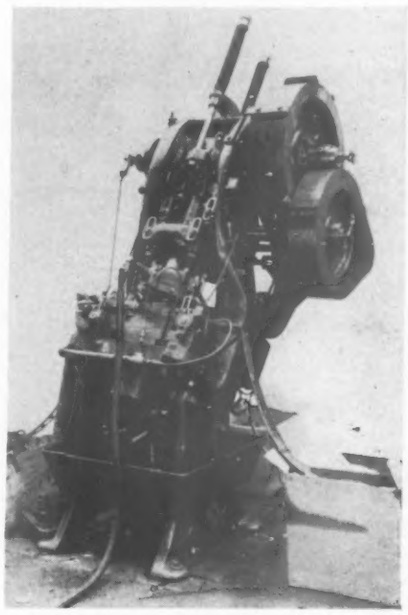


loading position. Cleaning cycle consists of two minutes in vapor, two minutes immersion in boiling solvent, followed by two minutes in the pure solvent vapors.

As work is carried out of vapors, it is clean, warm and dry. At the exit position, work is unloaded smoothly as conveyor changes direction of travel and tilts fixtures. At a conveyor speed of 8 inches per minute, this degreaser cleans 300 parts per hour or a production rate of 3000 pounds and up per hour.

Double-Action Press

■ Ferracute Machine Co., Bridgeton, N. J., has developed a double-action press for volumetric cutting of uncured rubber washers such as used in manufacture of rubber valve stems. The press reverses the motions of the ram and plunger and has ram operated by crank motion and plunger by cam motion. In operation, the rubber strip being fed from right to left is first lubricated with water and then com-



pressed by the plunger to a predetermined thickness for volume. The plunger dwells while ram descends and punches the center hole and a hollow cutter die cuts circumference of washer and ascends far enough to be out of the way before the plunger starts to ascend. Two air lines blow the slugs from the punch and the rubber washers from the press.

New Welding Rod For Reconditioning

■ American Manganese Steel division of American Brake Shoe & Foundry Co., Chicago Heights, Ill., has developed Amsco Dieweld welding rod primarily for reconditioning work on forging dies, hot and cold trimmers, etc. It is applicable to all ferrous base metals and deposits free from porosity by alternating or direct current electric welding method as well as by oxy-acetylene or atomic hydrogen welding process.

Amsco Dieweld air-hardens as welded and must be finished by grinding. For machining, it must be annealed and rehardened after machining. It has an average Rockwell hardness of between 55 and 60, either as welded or heat treated.

Co-ordinated Controls

(*Concluded from Page 48*)

lector. This last sets the shear to crop automatically at front, rear or both and also is used to inch the shear and to set for continuous cutting when strip is to be cut into sheets for piling.

Last panel on this benchboard, Fig. 9, controls first section of runout table and is equipped with meters to indicate power consumed and speed, palm buttons for start and stop and selecting switches for speeds desired.

In this pulpit (No. 5), three operators are kept busy. Other pulpits require only one operator. In pulpit No. 5, one operator works controls for sprays, finishing scale-breaker and Nos. 5 and 6 finishing stands. A second man handles controls for Nos. 7, 8, 9 and 10 finishing stands and the flying shear. The third works the looper controls and signals to the floor.

In pulpit No. 6, Fig. 6, are centered controls for the remainder of the line including second and third sections of runout table, the two coilers, transfer table to the cutting line which parallels the runout table, and also controls for the end piler.

As strip comes down the runout table, first runout table guides must be set, an adjacent dial indicating their position. Next, gates are lifted to deflect the steel into coiler below runout table level. Here pinch rolls force the strip into the coiler which is a series of individually driven rolls arranged with their axes on a circle with the strip fed down between two of them. Rolls revolve in such a direction that they guide sheet down and back up into a loop, forming it into a coil as more material continues to be fed in. Axes of coiler rolls are on a small circle at start. As the coil builds up, the circle expands, the rolls being hinged to open automatically against pneumatic pressure.

Continuous Coiling

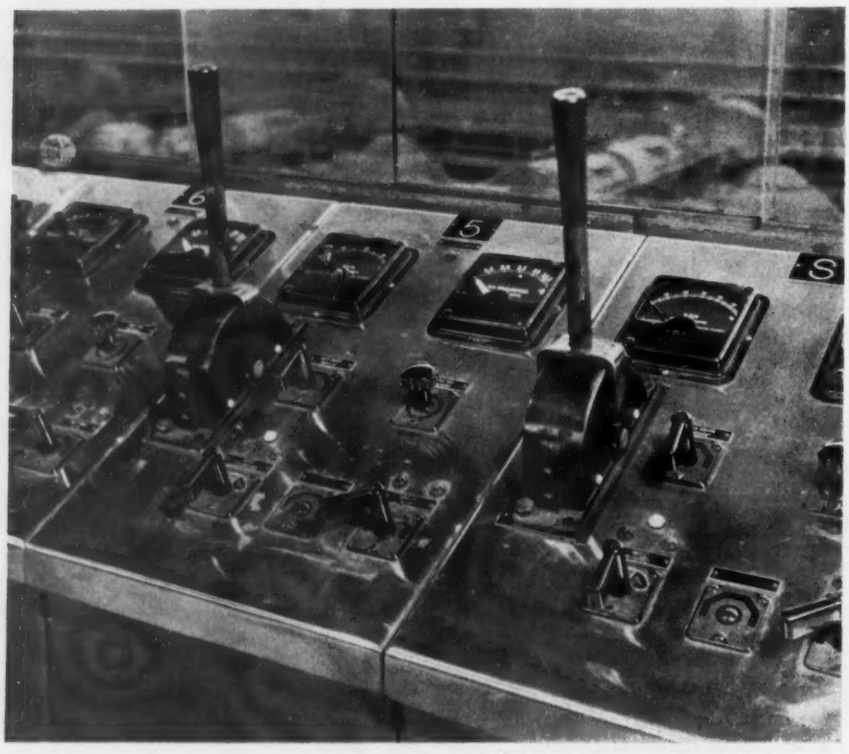
With entire length of strip wound into a coil, an arm on the coiler ram pushes the stripper out to discharge the coil onto a tilt carried in a buggy, which then moves to the chain conveyor. Here tilt is operated to deposit the coil onto a chain which carries it to coil storage.

Controls at pulpit No. 6 include meters which register speed of strip in feet per minute at exit end of No. 10 stand and at each of the three sections of the runout table, and also speed of coilers. These meters are mounted above the window, Fig. 6. Coiler controls include those for adjusting and operating the guides, pinch rolls, coiler rolls, coiler roll pressure, coil discharge, buggy position, tilt position, etc. Coiler controls, of course, are in duplicate as there are two coilers here so one coiler can be forming a coil while the other coiler is discharging the finished coil onto the conveyor line. This permits fast, continuous coiling.

Other controls in pulpit No. 6 include those to operate transfer table and end piler.

By centralizing controls in the six pulpits described and by careful placing of each individual control, it is not hard to see why this mill has been able to set new records. With operating controls reduced to essentials, with all speeds and power consumptions indicated, with conveniently located and fast operating control devices, with an exceptionally well planned layout of controls, not only does the control contribute to speed in mill operation but also is definitely a positive factor in assuring highest quality.

Fig. 10—Closeup of panels for scale-breaker No. 5 and part of No. 6 stand panel in finishing stand control pulpit No. 5



New Cutting Alloy Cast In Tool Bit Form

■ A cast nonferrous cutting alloy "Rexalloy" in tool bit form for machine tools has been developed by Crucible Steel Co. of America, 405 Lexington avenue, New York. The alloy has cobalt, chromium and tungsten for its basic elements and has such a high degree of hardness at elevated temperatures that it is practically unforgeable. Structural stability at extreme temperatures is indicated by the fact that only one point drop in hardness on the Rockwell C scale is occasioned after exposure to 2000 degrees Fahr. Toughness and resistance to abrasion are properties attained by this alloy in the cast condition and heat treatment is neither necessary nor particularly beneficial.

Tolley's Tax Tables

■ *Tolley's Income Tax Tables for* 1939-40, in chart form, published by Waterlow & Sons Ltd., London; supplied by STEEL, Cleveland; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London S.W. 1.

A convenient chart has been compiled by Charles H. Tolley, accountant and auditor, giving at a glance the taxes payable under the British income tax regulations at the rate of 5/6d. in the pound. Tables show the tax on each pound from £1 to £1000, and grossing-up tables show the gross amount for tax purposes at 5/6d. represented by each pound of net dividends from £1 to £1000. There are also tables from 1d. to £1 in both cases, and other useful tables relative to income tax regulations are included.

ADVERTISING PAGES REMOVED

Simplification

(*Concluded from Page* 114)

as total distortion when completed unit was given final machining was under 0.01-inch. Working faces of the slipper path and also of the ball-bearing housing were given a fine cut in the final machining operation.

Pivot bracket locating the center ball bearing consists of a square slab, 2 inches thick with anchoring plates welded on the under side for grouting into the concrete, and a solid forged pivot recessed into the slab. After unit was welded, pivot was machined carefully to fit the internal diameter of the ball bearing.

Bevel wheel was made from a rolled slab, 3½ inches thick, first rough machined to shape with a central hole 8½ inches in diameter. A boss made of rolled bar next was machined and fitted. After welding, the wheel was finished to size and teeth cut. Complete wheel with bracket and rack pinion is shown in Fig. 2.

Bracket carries the bevels, composed of plates 1 inch thick with rolled bars forming the bosses and a stiffening rib along the bottom to form a key in the concrete.

Saving in cost by adopting welding design amounted to $9136.80 if considered simply as a machine to deal with the roller paths of the tower units. Considering the welded machine and bridge which makes the unit suitable for handling all types of general work, the saving amounts to $7678.80. By far the greater part of this saving was due not simply to substituting welding for other construction, but to adopting an entirely new design which allowed economies in fabrication methods and machining not applicable to previous designs.

Use of this machine permitted the tower cranes to be delivered on time, and allowed the shipyard to go ahead with its shipbuilding program on schedule.

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Methods for Choosing And Landing a Job

■ *Pick Your Job and Land It*, by S. W. and M. G. Edlund, published by Prentice Hall Inc., New York; supplied by STEEL, Cleveland, for $3; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London S.W. 1.

Much of the material in this book was developed in a man-marketing clinic whose object was to assist men and women to get the jobs they want. Every Monday evening for over three years, from 40 to 150 people met in the clinic. The group included both unemployed and many employed seeking better jobs. Problems considered included means of getting leads, criticism of letters, advertisements of presentation, enacting sample interviews, and other details.

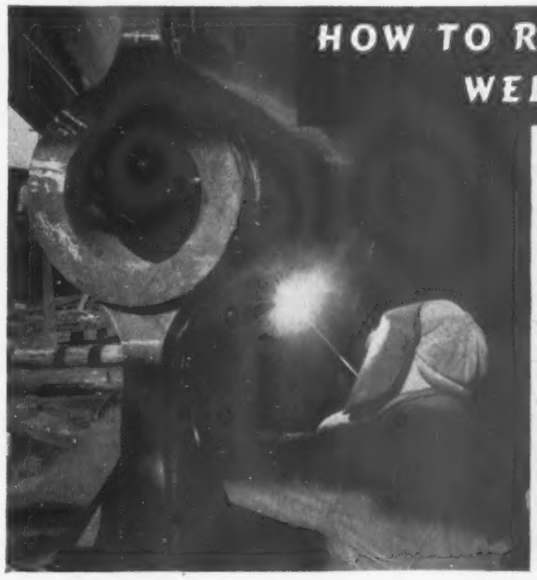
The book gives specific methods that have produced results in many cases. It shows how to fix a definite goal, how to discover abilities and talents, and how to secure the right prospects.

Heat Resisting Alloy

■ A recent patent covering a new cast iron alloy has been assigned to the Globe Iron Co. of Jackson, O. by the inventors Edwin A. Jones and A. H. Dierker, general manager and metallurgist, respectively, of the same company. Silicon and chromium are the principal alloying elements in the new cast iron. Developed for use at elevated temperatures, the iron is free from growth and scaling at temperatures up to 1500 degrees Fahr. and can be used at higher temperatures under proper conditions.

The material can be made at a comparatively low cost in the cupola or electric furnace of the average foundry by using certain special grades of pig iron produced by the Globe Iron Co.

HOW TO REDUCE YOUR WELDING COSTS

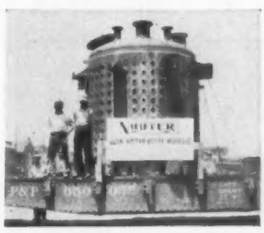


From coast to coast, in plants fabricating welded structures of every description, Murex electrodes are helping to reduce welding costs. The reasons why are many. In one plant high burn-off rate may prove an advantage. In another, rapid deposition, or lack of spatter and smoothness of deposit may do the trick.

There is little question but what, in your plant, too, these Murex features can effect real economies. Why not write today and ask to have a representative demonstrate Murex. No obligation is involved. And, if you have a problem or two concerning welding procedure, his broad experience may prove extremely useful.

1 In marine work, vertical and overhead welding goes easily and quickly with Murex Vertex (reverse polarity) or Genex (straight polarity). *Photo courtesy Ira S. Bushey & Sons Co., Inc., Brooklyn, N. Y.*

We've a pocket-size pamphlet giving properties of all electrodes in the Murex line. Send for your copy.



2 Only 2700 lbs. of Murex welded this 40,000 lbs. jacketed still. *Photo courtesy John Nooter Boiler Works Co., St. Louis, Mo.*

3 High speed deposition saves time and money on the Lorain 79 Shovel. *Photo courtesy The Thew Shovel Company, Lorain, Ohio.*

5 Economy of welding machinery such as this sluice gate hoist is increased by time-saving Murex Electrodes. *Photo courtesy Lakeside Bridge & Steel Co., Milwaukee, Wis.*

4 Free-flowing Murex downhand electrodes speeded welding on this 96,200 lb. pot chuck, 33 ft. 7 in. in diameter, believed to be world's largest. *Photo courtesy Lukenweld, Inc., Coatesville, Pa.*

MUREX
HEAVY COATED
ELECTRODES

METAL & THERMIT CORPORATION
120 Broadway, New York, N. Y.
Albany • Chicago • Pittsburgh
So. San Francisco • Toronto

Slings For Safety

(*Concluded from Page* 60)

cation of a basket hitch with both slings in a vertical position. This also is true where the crane itself is provided with two lifting hooks. However, the latter presents hazards when load is carried in an endwise position.

Movement of the crane then sets up a pendulum action in which the load carries back and forth in a straight line with its axis, producing a hacksaw action and causing the load to work in the bight of both slings. If this movement becomes violent, there is great danger of spilling the load.

Such movement is much less destructive to slings where the load is carried on one hook. In this case, all four sling parts swing in unison to describe an arc around the hook instead of traveling in a straight line. In describing the arc, the sling of course is not flexed and so receives no wear.

Anchor Hitch

The choker or anchor hitch is ideal from the rigger's viewpoint since it is just what its name implies. It chokes the load and holds like an anchor. However, this type of hitch is quite destructive to both the sling body and sling fittings. It is only 75 per cent efficient as compared with the same sling when applied in a straight-line pull.

While generally recognized as being hard on the sling equipment, the anchor hitch is firmly established as being the only satisfactory method where two slings are used to handle a tilted load or where the load is handled with a single sling.

Most important is relation between actual tension in a sling leg and its angle of inclination. The stress on a sling applied at 30 degrees to the load (an included angle between the legs of 120 degrees) is double that of the load itself. While this fact is generally known, it is often ignored in actual sling practice.

Included Angle Important

Safety demands that the included angle be less than 90 degrees and never in excess of 120 degrees. At an included angle of 120 degrees, the pull on the sling actually is double the load being lifted. This is the absolute deadline for sling application. Above 120 degrees, the increase in tension builds up rapidly. Where the angle is 5 degrees to the horizontal, the load on the sling is approximately 10 times that being lifted.

Safe practice also demands that attention be given additional stress imposed by quick starts, sudden stops and load collisions. The impact loading under any of these conditions is easily double the actual load being lifted. The effect on a choker hitch is the same as could be expected if three or four times the weight was being lifted. The action is almost identical with that of breaking a string upon itself when tying a package.

Thus it is important to take up the slack and start the lift slowly. It is equally important to avoid quick stops when the load is descending. Likewise collision with some fixed object when load is swinging is dangerous.

In landing a load, it should be positioned slowly. Otherwise the load exerts a sledgehammer effect upon the sling as it touches the floor. Of course the best way is to attach the sling in such a manner that it is not pinched beween the load and the floor when it is landed.

Rules of safe practice most essential in care of slings are four in number. First, keep the slings free from twists, knots and kinks. Second, lift from center of hooks, never on the point of a hook. Third, distribute the load evenly on all legs. Fourth, inspect the slings once each week.

These precautions with care in hitching will pay dividends in added sling life and safety.

♦

Distribution Through Manufacturers' Agents

■ *Effective Distribution Through Manufacturers' Agents*, by Walter Amory Allen; paper, 30 pages, 5 x 8 inches; published by Walter A. Allen, New Haven, Conn.; supplied by STEEL, Cleveland, for $1; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London S. W. 1.

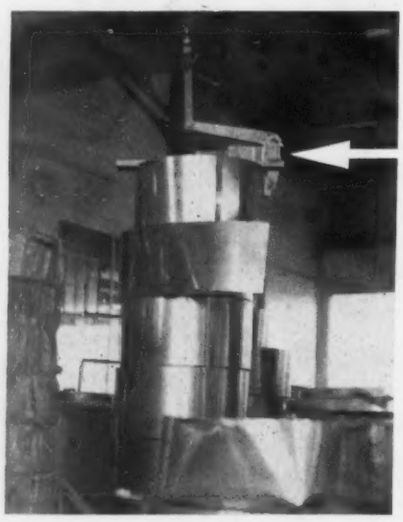
A discussion of the value of manufacturers' agents in the problem of distribution, the booklet is the result of long experience in an advisory capacity to manufacturers, on the part of the author. He compares the method of selling through agents and through salaried salesmen and points out some of the mistakes commonly made in choosing representatives.

Assuming that the importance of the manufacturers' agent is increasing in the modern selling picture, the author points the way to obtaining best results from their employment.

Beams And Rusty Bars In Reinforced Concrete

■ The use of high yield point steel as reinforcement in concrete beams and the effect of rust on the bond resistance of steel bars in concrete are discussed in a pamphlet "Report on: Rusty Bar Bond Tests and High Yield Point Steel Research", available from the publishers, Concrete Reinforcing Steel institute, Builders building, Chicago. Summary of tests included in the report indicate that the bond resistance for deformed bars exposed to normal rusting conditions is considerably greater than for nonrusted mill-surfaced bars and that, for the same concrete strength, the use of high yield point steel increases the concrete and form costs more than the saving in steel reinforcement.

HANDLING COILS VERTICALLY



Something new in coil handling for magnetic or non-magnetic coils is now ready for general distribution after three years of trial in New England plants. It is a new

MANSAVER GRAB

(PATENTED)

fully automatic in operation. It is made adjustable so the same grabs will handle coils having a wide variation in internal and external diameters as well as widths.

Mansaver grabs have been built for coils ranging from 250 to 3500 lbs. in weight. It is handling brass, silicon steel, 18-8 stainless both high and low carbon steel. For complete information write.

J-B ENGINEERING SALES CO., 1743 Orange St., New Haven, Conn.

Prices Reaffirmed; Business Expands

Orders and Operations Soar in Most Active Market in Years

MARKET IN TABLOID ★

Demand
Heavy; rail and ship demand spurs heavy products.

Prices
Finished steel extended; pig iron up $2; scrap jumps.

Production
Up 12 points to 74 per cent.

■ STEEL backlogs and production soared last week in one of the most active markets ever experienced by the industry. Late in the week reaffirmation of prices on most finished steel prices for next quarter delivery gave promise of tempering the buying rush at least to a moderate degree.

Steelmaking has jumped 12 points to 74 per cent. A year ago the rate was 46. Producers are pressing additional mill facilities into service as rapidly as possible, and further gains in operations are indicated for this week. Fourth quarter ingot production appears likely to be the largest for that period in history.

The surge of steel buying in a sense cannot be considered a war boom, since it has come largely from domestic consumers. However, an important factor behind the urgency of buyers to cover future needs has been the fear that the European situation would result in higher prices or would cause export orders to lengthen mill deliveries.

Producers have quelled expectations of an immediate advance in quotations on principal steel products with the announcement that present prices will apply on shipments through the remainder of this year. This action was taken in the face of a rapidly rising scrap market and sharp advances in prices of certain ferroalloys and other raw materials.

Mills are protecting themselves against further cost increases with the stipulation that any steel shipments after Dec. 31 will be invoiced at prices in effect at time of shipment. This action may be expected to maintain heavy deliveries through fourth quarter, since an upward price trend appears not improbable in the future. Furthermore, the delivery question is important to many buyers, as witnessed by their rush to secure positions on order books before the extension of prices.

Pig iron prices have been advanced $2 a ton on most grades. In some cases buyers were able to cover fourth quarter needs before the advance became effective. Ferromanganese, influenced by events abroad, has been raised $20, and other manganese alloys as well as tungsten alloys also are up. Foreign ore prices still are nominal but are pointed for sharp increases. Export prices on steel continue strong. On some products these quotations are at domestic levels but on the average are slightly less.

Export inquiries continue heavy, principally from neutral countries, but business actually placed so far has been relatively light. Large orders from belligerents, except possibly for pig iron and semifinished steel, are not expected for a number of months. Outstanding in the latter is an inquiry from the British government for 200,000 tons of steel, principally semifinished.

Particularly heartening in domestic demand is a broad revival in railroad orders and inquiries for track material and equipment. Rail purchases last week of 94,500 tons, plus 20,000 tons for Brazil, were the largest for a single week in years and are exceptional for this period.

Freight car awards include 2500 for the Pennsylvania and 500 for the Virginian. Pending and prospective car business, a large share of which has yet to come out for bids, has swelled markedly and promises active demand for heavy steel products in coming months. The outlook for plates and shapes also is aided by extensive shipbuilding programs. Bids close this week on 33 cargo vessels, involving 152,000 tons of steel.

The automobile industry is pressing for shipments of materials and parts. Assemblies rose 14,380 units to 26,865 last week, largest output in two months.

Tin plate demand has quickened, although usually the trend is downward at this time. Foreign demand is active, but some producers have withdrawn from the export market. Tin plate production is up 8 points to 68 per cent.

Scrap markets have stiffened abrupty in all districts, with heavy melting steel up $3 at Pittsburgh and $2 at Chicago. STEEL'S price composite jumped $2.04 last week to $17.83, highest in two years.

Nearly all steelmaking districts participated in the latest rise in production. Gains include 15 points to 70 per cent at Pittsburgh, 16 points to 67 at Chicago, 18 points to 75 at Youngstown and 15 points to 83 at Cleveland.

Other increases were 6 points to 86 at Wheeling, 6½ points to 67 at Buffalo, 10 points to 80 at Birmingham, 11 points to 57 in eastern Pennsylvania, 5 points to 75 in New England and 11 points to 68 at Cincinnati. Detroit held at 99 per cent and St. Louis was unchanged at 62.

COMPOSITE MARKET AVERAGES

	Sept. 16	Sept. 9	Sept. 2	One Month Ago Aug., 1939	Three Months Ago June, 1939	One Year Ago Sept., 1938	Five Years Ago Sept., 1934
Iron and Steel	$36.76	$36.01	$35.98	$35.95	$35.69	$36.48	$32.15
Finished Steel	55.60	55.60	55.60	55.60	55.70	57.20	54.00
Steelworks Scrap..	17.83	15.79	15.50	15.30	14.49	14.23	9.45

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Sept. 16, 1939	Aug. 1939	June 1939	Sept. 1938
Steel bars, Pittsburgh	2.15c	2.15c	2.15c	2.25c
Steel bars, Chicago	2.15	2.15	2.15	2.25
Steel bars, Philadelphia	2.47	2.47	2.47	2.57
Iron bars, Terre Haute, Ind.	2.05	2.05	2.05	2.15
Shapes, Pittsburgh	2.10	2.10	2.10	2.10
Shapes, Philadelphia	2.215	2.215	2.215	2.215
Shapes, Chicago	2.10	2.10	2.10	2.10
Plates, Pittsburgh	2.10	2.10	2.10	2.10
Plates, Philadelphia	2.15	2.15	2.15	2.15
Plates, Chicago	2.10	2.10	2.10	2.10
Sheets, hot-rolled, Pittsburgh	2.00	2.00	2.00	2.15
Sheets, cold-rolled, Pittsburgh	3.05	3.05	3.05	3.20
Sheets, No. 24 galv., Pittsburgh	3.50	3.50	3.50	3.50
Sheets, hot-rolled, Gary	2.00	2.00	2.00	2.15
Sheets, cold-rolled, Gary	3.05	3.05	3.05	3.20
Sheets, No. 24 galv., Gary	3.50	3.50	3.50	3.50
Bright bess., basic wire, Pitts.	2.60	2.60	2.60	2.60
Tin plate, per base box, Pitts.	$5.00	$5.00	$5.00	$5.35
Wire nails, Pittsburgh	2.45	2.40	2.45	2.45

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$34.00	$34.00	$34.00	$34.00
Slabs, Pittsburgh, Chicago	34.00	34.00	34.00	34.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	34.00
Wire rods, No. 5 to $\frac{9}{32}$-inch, Pitts.	43.00	43.00	43.00	43.00

Pig Iron

	Sept. 16, 1939	Aug. 1939	June 1939	Sept. 1938
Bessemer, del. Pittsburgh	$24.34	$22.34	$22.34	$21.34
Basic, Valley	22.50	20.50	20.50	19.50
Basic, eastern, del. Philadelphia	24.34	22.34	22.34	21.34
No. 2 foundry, Pittsburgh	24.21	22.21	22.21	21.21
No. 2, foundry, Chicago	23.00	21.00	21.00	20.00
Southern No. 2, Birmingham	19.38	17.38	17.38	16.38
Southern No. 2, del. Cincinnati	22.89	20.89	20.89	19.89
No. 2X, del. Phila. (differ. av.)	25.215	23.215	23.215	22.215
Malleable, Valley	23.00	21.00	21.00	20.00
Malleable, Chicago	23.00	21.00	21.00	20.00
Lake Sup., charcoal, del. Chicago	30.34	28.34	28.34	28.34
Gray forge, del. Pittsburgh	23.17	21.17	21.17	20.17
Ferromanganese, del. Pittsburgh	105.33	85.33	85.33	97.77

Scrap

Heavy melting steel, Pittsburgh	$19.75	$16.15	$15.00	$15.25
Heavy melt. steel, No. 2, E. Pa.	16.75	14.375	13.125	12.75
Heavy melting steel, Chicago	15.75	13.75	13.55	13.60
Rails for rolling, Chicago	18.75	17.75	17.75	17.75
Railroad steel specialties, Chicago	17.00	15.50	15.50	16.60

Coke

Connellsville, furnace, ovens	$3.75	$3.75	$3.75	$3.75
Connellsville, foundry, ovens	5.00	5.00	5.00	5.00
Chicago, by-product fdry., del.	10.50	10.50	10.50	10.50

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Hot Rolled

Pittsburgh	2.00c
Chicago, Gary	2.00c
Cleveland	2.00c
Detroit, del.	2.10c
Buffalo	2.00c
Sparrows Point, Md.	2.00c
New York, del.	2.24c
Philadelphia, del.	2.17c
Granite City, Ill.	2.10c
Middletown, O.	2.00c
Youngstown, O.	2.00c
Birmingham	2.00c
Pacific Coast points	2.50c

Cold Rolled

Pittsburgh	3.05c
Chicago, Gary	3.05c
Buffalo	3.05c
Cleveland	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.37c
New York, del.	3.39c
Granite City, Ill.	3.15c
Middletown, O.	3.05c
Youngstown, O.	3.05c
Pacific Coast points	3.65c

Galvanized No. 24

Pittsburgh	3.50c
Chicago, Gary	3.50c
Buffalo	3.50c
Sparrows Point, Md.	3.50c
Philadelphia, del.	3.67c
New York, delivered	3.74c
Birmingham	3.50c
Granite City, Ill.	3.60c
Middletown, O.	3.50c
Youngstown, O.	3.50c
Pacific Coast points	4.00c

Black Plate, No. 29 and Lighter

Pittsburgh	3.05c
Chicago, Gary	3.05c
Granite City, Ill.	3.15c

Long Ternes No. 24 Unassorted

Pittsburgh, Gary	3.80c
Pacific Coast	4.50c

Enameling Sheets

	No. 10	No. 20
Pittsburgh	2.75c	3.35c
Chicago, Gary	2.75c	3.35c
Granite City, Ill.	2.85c	3.45c
Youngstown, O.	2.75c	3.35c
Cleveland	2.75c	3.35c
Middletown, O.	2.75c	3.35c
Pacific Coast	3.35c	3.95c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	24.00	35.00
Cold stp.	22.00	22.50	32.00	52.00

Steel Plate

Pittsburgh	2.10c
New York, del.	2.29c
Philadelphia, del.	2.15c
Boston, delivered	2.42c
Buffalo, delivered	2.33c
Chicago or Gary	2.10c
Cleveland	2.10c
Birmingham	2.10c
Coatesville, Pa.	2.10c
Sparrows Point, Md.	2.10c
Claymont, Del.	2.10c
Youngstown	2.10c
Gulf ports	2.45c
Pacific Coast points	2.60c

Steel Floor Plates

Pittsburgh	3.35c
Chicago	3.35c
Gulf ports	3.70c
Pacific Coast ports	3.95c

Standard Shapes

Pittsburgh	2.10c
Philadelphia, del.	2.21½c
New York, del.	2.27c
Boston, delivered	2.41c
Bethlehem	2.10c
Chicago	2.10c
Cleveland, del.	2.30c
Buffalo	2.10c
Gulf ports	2.45c
Birmingham	2.10c
St. Louis, del.	2.34c
Pacific Coast points	2.70c

Tin and Terne Plate

Tin Plate, Coke (base box)

Pittsburgh, Gary, Chicago	$5.00
Granite City, Ill.	5.10

Mfg. Terne Plate (base box)

Pittsburgh, Gary, Chicago	$4.30
Granite City, Ill.	4.40

Bars

Soft Steel

(Base, 20 tons or over)

Pittsburgh	2.15c
Chicago or Gary	2.15c
Duluth	2.25c
Birmingham	2.15c
Cleveland	2.15c
Buffalo	2.15c
Detroit, delivered	2.25c
Philadelphia, del.	2.47c
Boston, delivered	2.52c
New York, del.	2.49c
Gulf ports	2.50c
Pacific Coast points	2.75c

Rail Steel

(Base, 15 tons or over)

Pittsburgh	2.00c
Chicago or Gary	2.00c
Detroit, delivered	2.10c
Cleveland	2.00c

Buffalo	2.00c
Birmingham	2.00c
Gulf ports	2.35c
Pacific Coast points	2.60c

Iron

Chicago, Terre Haute	2.05c
Philadelphia	2.37c
Pittsburgh, refined	3.50-8.00c

Reinforcing

*New Billet Bars, Base**

Chicago, Gary, Buffalo, Cleve., Birm., Young., Sparrows Pt., Pitts.	1.90c
Gulf ports	2.25c
Pacific Coast ports	2.35c

*Rail Steel Bars, Base**

Pittsburgh, Gary Chicago, Buffalo, Cleveland, Birm.	1.80c
Gulf ports	2.15c
Pacific Coast ports	2.25c

**Base prices 20 cents less per 100 lbs. on billet bars, 15 cents less on rail steel, in lots of 20 tons or over of one size, in lengths of 30 feet or over, for shipment at one time to one destination.*

Wire Products

Pitts-Cleve.-Chicago-Birm. base per 100 lb. keg in carloads

Standard wire nails	$2.40
Cement coated nails	$2.40

(Per pound)

Polished fence staples	2.40c
Galv. barbed wire, standard 12½ gage two-point hog, 80-rod spool $2.76; two-point cattle, 80-rod spool	$2.58
Annealed fence wire	2.90c
Galv. fence wire	3.30c
Woven wire fencing (base C. L. column)	97.00
Single loop bale ties (base C. L. column)	56.00

To Manufacturing Trade

Base, Pitts. - Cleve. - Chicago-Birmingham (except spring wire)

Bright bess., basic wire	2.60c
Galvanized wire	2.65c
Spring wire	3.20c

Worcester, Mass., $2 higher on bright basic and spring wire.

Cut Nails

Carloads, Pittsburgh $3.60

Cold-Finished Bars

	Carbon	Alloy
Pittsburgh	2.65c	3.35c
Chicago	2.65c	3.35c
Gary, Ind.	2.65c	3.35c
Detroit	2.70c	*3.45c
Cleveland	2.65c	3.35c
Buffalo	2.65c	3.35c

* Delivered.

Alloy Bars (Hot)

(Base, 3 tons or over)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	2.70c
Detroit, delivered	2.80c

Alloy	Diff.	Alloy	Diff.
S.A.E.		S.A.E.	
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.	0.55
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni.	1.10
5100 0.80-1.10 Cr.	0.45
5100 Cr. spring flats	0.15
6100 bars	1.20
6100 spring flats	0.85
Cr. N., Van.	1.50
Carbon Van.	0.85
9200 spring flats	0.15
9200 spring rounds, squares	0.40

Electric furnace up 50 cents.

Strip and Hoops

(Base, hot strip, 1 ton or over; cold, 3 tons or over)

Hot Strip, 12-inch and less

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, Birmingham	2.00c
Detroit, del.	2.10c
Philadelphia, del.	2.32c
New York, del.	2.36c
Cooperage hoop, Youngs., Pitts.; Chicago, Birm.	2.10c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland, Youngstown	2.80c
Chicago	2.90c
Detroit, del.	2.90c
Worcester, Mass.	3.00c

Carbon	Cleve.,	Pitts.
0.26—0.50		2.80c
0.51—0.75		4.30c
0.76—1.00		6.15c
Over 1.00		8.35c

Worcester, Mass. $4 higher.

Commodity Cold-Rolled Strip

Pitts.-Cleve.-Youngstown	2.95c
Detroit, del.	3.05c
Worcester, Mass.	3.95c

Lamp stock up 10 cents.

Rails, Fastenings

(Gross Tons)

Standard rails, mill	$40.00
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pitts., Chicago, B'ham.	$40.00
Do., rerolling quality	39.00

Cents per pound

Angle bars, billet, mills	2.70c
Do., axle steel	2.35c
Spikes, R. R. base	3.00c
Track bolts, base	4.15c
Car axles forged, Pitts., Chicago, Birmingham	3.15c
Tie plates, base	2.15c

Base, light rails 25 to 60 lbs., 20 lbs., up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists, carloads 5% up; full containers additional 10%.

Carriage and Machine

½ x 6 and smaller	68.5 off
Do. larger, to 1-in.	66 off
Do. 1⅛ and larger	64 off
Tire bolts	52.5 off

Stove Bolts

In packages with nuts attached 72.5 off; in packages with nuts separate 72.5-12½ off; bulk 84 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.

Step bolts	60 off
Elevator bolts	60 off
Plow bolts	68.5 off

Nuts

Semifinished hex.	U.S.S.	S.A.E.
6-inch and less	67	70
⅞-1-inch	64	65
1⅛ and larger	62	62

Hexagon Cap Screws

Upset, 1-in., smaller 67.5 off

Square Head Set Screws

Upset, 1-in., smaller	75.0 off
Headless set screws	70.0 off

Piling

Pitts., Chgo., Buffalo	2.40c
Gulf ports	2.75c

Rivets, Washers

Structural, Pittsburgh, Cleveland, Chicago	3.40c
⅞-inch and smaller, 11 and 12	63½ 54
Pitts., Chi., Cleve.	65-10 off

Wrought washers, Pitts., Chi., Phila., to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75 off

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2½ and 1½ less, respectively. Wrought pipe, Pittsburgh base.

Butt Weld

Steel

In.	Blk.	Galv.
½	63½	54
¾	66½	58
1—3	68½	60½

Iron

¾	30	13
1—1¼	34	19
1½	38	21½
2	37½	21

Lap Weld

Steel

2	61	52½
2½—3	64	55½
3½—6	66	57½
7 and 8	65	55½
9 and 10	64½	55

Iron

2	30½	15
2½—3½	31½	17½
4	33½	21
4½—8	32½	20
9—12	28½	15

Line Pipe

Steel

1 to 3, butt weld	67½	
2, lap weld	60	
2½ to 3, lap weld	63	
3½ to 6, lap weld	65	
7 and 8, lap weld	64	
10-inch lap weld	63½	
12-inch, lap weld	62½	

Iron

	Blk.	Galv.
¾ butt weld	25	7
1 and 1¼ butt weld	29	13
1½ butt weld	33	15½
2 butt weld	32½	15
1½ lap weld	23½	7
2 lap weld	25½	9
2½ to 3½ lap weld	26½	11½
4 lap weld	28½	15
4½ to 8 lap weld	27½	14
9 to 12 lap weld	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet; f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Welded

Sizes	Gage	Steel	Charcoal Iron
1½" O.D.	13	$ 9.72	$23.71
1¾" O.D.	13	11.06	22.93
2" O.D.	13	12.38	19.35
2¼" O.D.	13	13.79	21.68
2¼" O.D.	12	15.16	.....
2½" O.D.	12	16.58	26.57
2¾" O.D.	12	17.54	29.00
3" O.D.	12	18.35	31.36
3½" O.D.	11	23.15	39.81
4" O.D.	10	28.66	49.90
5" O.D.	9	44.25	73.93
6" O.D.	7	68.14	.....

Seamless

Sizes	Gage	Hot Rolled	Cold Drawn
1 "O.D.	13	$ 7.82	$ 9.01
1¼ "O.D.	13	9.26	10.67
1½ "O.D.	13	10.23	11.79
1¾ "O.D.	13	11.64	13.42
2" O.D.	13	13.04	15.03
2¼ "O.D.	13	14.54	16.76
2¼ "O.D.	12	16.01	18.45
2½ "O.D.	12	17.54	20.21
2¾ "O.D.	12	18.59	21.42
3" O.D.	12	19.50	22.48
3½ "O.D.	11	24.62	28.37
4" O.D.	10	30.54	35.20
4½ "O.D.	10	37.35	43.04
5" O.D.	9	46.87	54.01
6" O.D.	7	71.96	82.93

Cast Iron Pipe

Class B Pipe—Per Net Ton

6-in., & over, Birm.	$42.00-43.00
4-in., Birmingham	45.00-46.00
4-in., Chicago	53.80-54.80
6-in. & over, Chicago	50.80-51.80
6-in. & over, east fdy.	46.00
Do., 4-in.	49.00

Class A Pipe $3 over Class B Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Rerolling Billets, Slabs

(Gross Tons)

Pittsburgh, Chicago, Gary, Cleve., Buffalo, Young., Birm., Sparrows Point	$34.00
Duluth (billets)	36.00
Detroit, delivered	36.00

Forging Quality Billets

Pitts., Chi., Gary, Cleve., Young., Buffalo, Birm.	40.00
Duluth	42.00

Sheet Bars

Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago	34.00
Detroit, delivered	36.00

Wire Rods

Pitts., Cleveland, Chicago, Birmingham No. 5 to $\frac{9}{32}$-inch incl.	43.00
Do., over $\frac{9}{32}$ to $\frac{41}{64}$-in.incl.	48.00

Worcester up $2; Galveston up $6; Pacific Coast up $9.

Skelp

Pitts., Chi., Youngstown, Coatesville, Sparrows Pt.	1.90c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$3.75
Connellsville, fdry.	4.75- 5.50
Connell. prem. fdry.	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.50- 5.75
Wise county fur.	4.50- 4.75

By-Product Foundry

Newark, N. J., del.	10.88-11.35
Chi., ov., outside del.	9.75
Chicago, del.	10.50
Terre Haute, del.	10.00
Milwaukee, ovens	10.50
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.00
Indianapolis, del.	10.00
Cincinnati, del.	9.75
Cleveland, del.	10.30
Buffalo, del.	10.50
Detroit, del.	10.25
Philadelphia, del.	10.65

Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol	16.00c
Toluol, two degree	22.00c
Solvent naphtha	26.00c
Industrial xylol	26.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
Do. (450 lbs)	15.25c

Eastern Plants, per lb.

Naphthalene flakes, balls, bbls. to jobbers	5.75c

Per ton, bulk, f.o.b. port

Sulphate of ammonia	$28.00

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$24.00	$24.50	$23.50	$25.00
Birdsboro, Pa.	24.00	24.50	23.50	25.00
Birmingham, Ala.‡	19.38	....	18.38	24.00
Buffalo	23.00	23.50	22.00	24.00
Chicago	23.00	23.00	22.50	23.50
Cleveland	23.00	23.00	22.50	23.50
Detroit	23.00	23.00	22.50	23.50
Duluth	23.50	23.50	....	24.00
Erie, Pa.	23.00	23.50	22.50	24.00
Everett, Mass.	24.00	24.50	23.50	25.00
Granite City, Ill.	23.00	23.00	22.50	23.50
Hamilton, O.	23.00	23.00	22.50	....
Neville Island, Pa.	23.00	23.00	22.50	23.50
Provo, Utah	21.00	....	....	....
Sharpsville, Pa.	23.00	23.00	22.50	23.50
Sparrow's Point, Md.	24.00	.	23.50	....
Swedeland, Pa.	24.00	24.50	23.50	25.00
Toledo, O.	23.00	23.00	22.50	23.50
Youngstown, O.	23.00	23.00	22.50	23.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	24.39	24.39	23.89	24.89
Baltimore from Birmingham	24.78	....	23.66	....
Boston from Birmingham	24.12	....	....	....
Boston from Everett, Mass.	24.50	25.00	24.00	25.50
Boston from Buffalo	24.50	25.00	24.00	25.50
Brooklyn, N. Y., from Bethlehem	26.50	27.00	.	....
Canton, O., from Cleveland	24.39	24.39	23.89	24.89
Chicago from Birmingham	†23.22	..	....	....
Cincinnati from Hamilton, O.	23.24	24.11	23.61	....
Cincinnati from Birmingham	23.03	....	22.03	....
Cleveland from Birmingham	23.32	..	22.82	.
Mansfield, O., from Toledo, O.	24.94	24.94	24.44	24.44
Milwaukee from Chicago	24.10	24.10	23.60	24.60
Muskegon, Mich., from Chicago, Toledo or Detroit	26.19	26.19	25.69	26.69
Newark, N. J., from Birmingham	25.15	....	....	....
Newark, N. J., from Bethlehem	25.53	26.03	.	....
Philadelphia from Birmingham	24.46	.	23.96	....
Philadelphia from Swedeland, Pa.	24.84	25.34	24.34	....
Pittsburgh district from Neville Island	Neville base, plus 69c, 84c, and $1.24 freight.			
Saginaw, Mich., from Detroit	25.45	25.45	24.95	24.95

	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis, northern	23.50	23.50	23.00	....
St. Louis from Birmingham	†23.12	....	22.62	....
St. Paul from Duluth	25.63	25.63	....	26.13

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Buffalo, N. Y., $28.50, base; $29.74 delivered Philadelphia.

Gray Forge		Charcoal	
Valley furnace	$22.50	Lake Superior fur.	$27.00
Pitts. dist. fur.	22.50	do., del. Chicago	30.34
		Lyles, Tenn.	26.50

†Silvery

Jackson county, O., base: 6-6.50 per cent $27.50; 6.51-7—$28.00; 7-7.50—$28.50; 7.51-8—$29.00; 8-8.50—$29.50; 8.51-9—$30.00; 9-9.50—$30.50; Buffalo, $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base; Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$60.80

First Quality

Pa., Ill., Md., Mo., Ky.	47.50
Alabama, Georgia	47.50
New Jersey	52.50

Second Quality

Pa., Ill., Ky., Md., Mo.	42.75
Georgia, Alabama	34.20
New Jersey	49.00

Ohio

First quality	39.90
Intermediate	36.10
Second quality	31.35

Malleable Bung Brick

All bases	$56.05

Silica Brick

Pennsylvania	$47.50
Joliet, E. Chicago	55.10
Birmingham, Ala.	47.50

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$28.00
Wire cut	$26.00

Magnesite

Imported dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Do. domestic	40.00
Do., f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00
Quickset magnesite grains, f.o.b. Chewelah, Wash., net, bulk	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$47.00
Chem. bonded chrome	47.00
Magnesite brick	67.00
Chem. bonded magnesite	57.00

Fluorspar

Washed gravel, duty pd., tide, net ton	$24.50
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	19.00-20.00
Do. barge	19.00-20.00
No. 2 lump	19.00-20.00

Ferroalloy Prices

Ferromanganese, 78-82%, tidewater, duty pd. $100.00; Do., del. Pittsburgh 105.33

Spiegeleisen, 19-21% dom. Palmerton, Pa., spot 32.00; Do., 26-28%, Palmerton 33.00

Ferrosilicon, 50% freight allowed, c.l. 69.50; Do., ton lot 80.50; Do., 75 per cent 126.00. Spot, $5 a ton higher.

Silicomanganese, 2½ c. 109.00; 2% carbon, 108.00; 1%, 118.00. Contract ton price $11 higher; spot $5 over contract.

Ferrotungsten, stand., lb. con. del. cars 2.00

Ferrovanadium, 35 to 40%, lb., cont. 2.70-2.80-2.90

Ferrophosphorus, gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage, 58.50; electrolytic, per ton, c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage 75.00

Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., contained cr., del. carlots 10.50c; Do., ton lots 11.25c; Do., less-ton lots 11.50c

67-72% carloads, 2% carbon, per lb. contained chrome 16.50c; Do., ton lots 17.25c; Do., less-ton lots 17.75c

	Carloads	Ton lots	Less ton
2% carb.	16.50c	17.25c	17.50c
1% carb.	17.50c	18.25c	18.50c
0.10% carb.	18.50c	19.25c	19.50c
0.20% carb.	19.50c	20.25c	20.50c

Spot ¼c higher

Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. 0.95

Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80

Ferrotitanium, 40-45%, lb., con. tl., f.o.b. Niagara Falls, ton lots $1.23; Do., less-ton lots 1.25

20-25% carbon, 0.10 max., ton lots, lb. 1.35; Do, less-ton lots 1.40

Spot 5c higher

Ferrocolumbium, 50-60%, contract, lb. con. col., f.o.b. Niagara Falls $2.25; Do., less-ton lots 2.30

Spot is 10c higher

Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill 0.80

Ferro-carbon-titanium, 15-18%, ti., 6-8% carb., carlots, contr., net ton $142.50; Do, spot 145.00; Do, contract, ton lots 145.00; Do, spot, ton lots 150.00

15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50; Do, spot 160.00; Do, contract, ton lots 160.00; Do, spot, ton lots 165.00

Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c; Do, ton lots 8.00c; Do, less-ton lots 8.50c

Spot ½c lb. higher

Chromium Briquets, contract, any quantity, freight allowed, lb. 7.25c; Do, spot carlots, bulk 7.50c; Do, ton lots 8.00c; Do., less-ton lots 8.25c

Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb. $2.50; Do, smaller lots 2.60

Vanadium Pentoxide, contract, lb. contained $1.10; Do, spot 1.15

Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome 80.00c; Do, spot 85.00c

88% chrome, contract 79.00c; Do, spot 84.00c

Silicon Metal, 1% iron, contract, carlots, 2 x ⅛-in., lb. 14.00c; Do., 2% 12.50c

Spot ¼c higher

Silicon Briquets, contract carloads freight allowed, ton $69.50; Carload, spot 74.50; Less-ton lots, lb. 3.75c

Manganese Briquets, contract carloads, bulk freight allowed, lb. 5.00c; Ton lots 5.50c; Less-ton lots 5.75c

Spot ¼c higher

Zirconium Alloy, 12-15%, contract, carloads, gross ton $97.50; Do, spot 102.50

34-40%, contract, carloads, lb., alloy 14.00c; Do, ton lots 15.00c; Do, less-ton lots 16.00c

Spot ¼c higher

Molybdenum Powder, 99%, f.o.b. York, Pa. 200-lb. kegs, lb. $2.60; Do, 100-200 lb. lots 2.75; Do, under 100-lb. lots 3.00

Molybdenum Oxide Briquets, 48-52% molybdenum, per pound contained, f.o.b. producers' plant 80.00c

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets: Hot Rolled	Sheets: Cold Rolled	Sheets: Galv. No. 24	Cold Rolled Strip	Cold Drawn Bars: Carbon	Cold Drawn Bars: SAE 2300	Cold Drawn Bars: SAE 3100
Boston	3.88	4.06	5.06	3.85	3.85	5.66	3.71	4.78	4.61	3.46	4.13	8.63	7.23
New York (Met.)	3.84	3.96	3.96	3.76	3.75	5.56	3.40	4.60	4.50	3.51	4.09	8.59	7.19
Philadelphia	3.60	3.60	4.10	3.40	3.40	5.00	3.40	4.55	4.43	3.51	4.06	8.56	7.16
Baltimore	3.70	3.85	3.80	3.55	3.55	5.00	3.55	4.90	5.05	....	4.05	....	....
Norfolk, Va.	3.90	4.00	....	3.75	3.75	5.20	3.75	....	5.40	....	4.15	....	....
Buffalo	3.35	3.82	3.82	3.62	3.40	5.25	3.35	4.40	4.40	3.42	3.75	8.15	6.75
Pittsburgh	3.35	3.60	3.60	3.40	3.40	5.00	3.35	....	4.50	3.35	3.65	8.35	6.95
Cleveland	3.25	3.50	3.50	3.40	3.58	5.18	3.35	4.55	4.62	3.20	3.75	8.15	6.75
Detroit	3.33	3.43	3.68	3.60	3.65	5.27	3.43	4.50	4.59	3.40	3.80	8.45	7.05
Cincinnati	3.60	3.67	3.67	3.65	3.68	5.28	3.42	....	4.57	3.45	4.00	8.50	7.10
Chicago	3.50	3.60	3.60	3.55	3.55	5.15	3.35	4.30	4.25	3.50	3.75	8.15	6.75
Twin Cities	3.75	3.85	3.85	3.80	3.80	5.40	3.60	4.95	4.50	3.83	4.34	8.84	7.44
Milwaukee	3.63	3.73	3.73	3.68	3.68	5.28	3.48	4.43	4.38	....	3.88	8.38	6.98
St. Louis	3.62	3.72	3.72	3.47	3.47	5.07	3.38	4.32	4.52	3.61	4.02	8.52	7.12
Kansas City	4.05	4.15	4.15	4.00	4.00	5.60	3.90	....	5.00	....	4.30	....	....
Memphis	3.90	4.00	4.00	3.95	3.95	5.71	3.75	....	5.00	....	4.31	....	....
Chattanooga	3.80	3.90	3.90	3.85	3.85	5.80	3.65	....	4.40	....	4.39	....	....
Tulsa, Okla.	4.44	4.54	4.54	4.33	4.33	5.93	4.24	....	5.19	....	4.69	....	....
Birmingham	3.50	3.60	3.60	3.55	3.55	5.88	3.35	....	4.85	....	4.43	....	....
New Orleans	3.85	4.65	4.65	3.80	3.80	5.75	4.10	....	4.60	5.00	5.10	....	....
Houston, Tex.	3.50	5.85	6.25	4.05	4.05	5.65	3.95	....	5.25	....	....	....	....
Seattle	3.65	3.85	5.20	3.40	3.50	5.25	3.70	6.50	4.75	....	5.60	....	....
Portland, Oreg.	4.00	4.40	6.10	4.00	4.00	5.50	3.95	6.50	4.75	....	5.85	....	....
Los Angeles	4.00	4.50	6.35	4.00	4.00	6.20	4.20	6.30	5.00	4.45	6.00	10.40	9.55
San Francisco	4.00	4.35	[illegible]	4.00	4.00	5.60	3.75	6.40	5.15	....	6.55	10.65	9.80

	SAE Hot-rolled Bars (Unannealed): 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series
Boston	4.18	7.50	6.05	5.80	7.90
New York (Met.)	4.04	7.35	5.90	5.65	....
Philadelphia	3.85	7.31	5.86	5.61	7.71
Baltimore	3.85	....	....	....	....
Norfolk, Va.	....	....	....	....	....
Buffalo	3.55	7.10	5.65	5.40	7.50
Pittsburgh	3.40	7.35	5.95	5.50	7.60
Cleveland	3.30	7.30	5.85	5.85	7.70
Detroit	3.38	7.42	5.97	5.72	7.19
Cincinnati	3.65	7.44	5.99	5.74	7.84
Chicago	3.70	7.10	5.65	5.40	7.50
Twin Cities	3.95	7.45	6.00	6.09	8.19
Milwaukee	3.78	7.33	5.88	5.63	7.73
St. Louis	3.82	7.47	6.02	5.77	7.87
Seattle	5.65	....	7.80	7.65	8.45
Portland, Oreg.	5.70	....	7.80	7.65	8.50
Los Angeles	4.65	9.40	8.55	8.40	9.05
San Francisco	5.00	9.65	8.80	8.65	9.30

BASE QUANTITIES

Soft Bars, Bands, Hoops, Plates, Shapes, Floor Plates, Hot Rolled Sheets and SAE 1035-1050 Bars: Base, 400-1999 pounds, except 0-1999 pounds (hot rolled sheets only) in New York; 300-1999 pounds in Los Angeles; 0-299 pounds (hoops only) in San Francisco; 300-4999 pounds in Portland, Seattle; 400-14,999 pounds in Twin Cities; 400-3999 pounds in Birmingham.

Cold Rolled Sheets: Base, 400-1499 pounds in Chicago, Cincinnati, Cleveland, Detroit, New York and St. Louis; 450-3749 pounds in Boston; 500-1499 pounds in Buffalo; 1000-1999 pounds in Philadelphia; 300-4999 pounds in San Francisco and Portland; any quantity in Twin Cities.

Galvanized Sheets: Base, 0-1499 pounds in New York, Tulsa; 150-1499 pounds in Cleveland, Pittsburgh; 1-9 bundles in Baltimore, Norfolk; 1-6 bundles in Los Angeles; 300-4999 pounds in Portland, Seattle, San Francisco; 450-3749 pounds in Boston; 500-1499 pounds in Birmingham, Chicago, Cincinnati, Detroit, St. Louis; 1500 pounds and over in Chattanooga, Philadelphia; any quantity in Twin Cities.

Cold Rolled Strip: No base quantity; extras apply on lots of all size.

Cold Finished Bars: Base, 1000 pounds and over, except 0-299 pounds in San Francisco.

SAE Hot Rolled Alloy Bars: Base, 1000 pounds and over, except 0-4999 pounds in San Francisco; 0-1999 in Portland.

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, Sept. 14

Export Prices f. o. b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports £ s d	Quoted in dollars at current value	Continental Channe or North Sea ports, gross tons **Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Si.	$20.50 5 2 6	$18.32	2 3 0
Basic bessemer	....	19.59	2 6 0
Hematite, Phos. .03-.05	21.00 5 5 0*	.....	.....
Billets	$29.50 7 7 6	$38.34	4 10 0
Wire rods, No. 5 gage	45.50 11 7 6	43.67	5 2 6
Standard rails	$38.00 9 10 0	$48.99	5 15 0
Merchant bars	1.94c 11 0 0	1.81c to 1.90c	4 15 0 to 5 0 0
Structural shapes	1.77c 10 0 0	1.76c to 1.81c	4 12 6 to 4 15 0
Plates, †¼ in. or 5 mm.	1.93c 10 18 9	2.14c to 2 33c	5 12 6 to 6 2 6
Sheets, black, 24 gage or 0.5 mm	2.30c 13 0 0	2.90c	7 12 6*
Sheets, gal., 24 ga., corr.	2.78c 15 15 0	3.47c	9 2 6
Bands and strips	2.16c 12 5 0	1.90c to 1.92c	5 0 0 to 5 1 0
Plain wire, base	3.45c 19 10 0	2.33c to 2.66c	6 2 6 to 7 0 0
Galvanized wire, base	4.00c 23 5 0	2.99c	7 17 6
Wire nails, base	....	2.66c to 2.76c	7 0 0 to 7 5 0
Tin plate, box 108 lbs.	$ 4.05 1 0 3	.....	.....

British ferromanganese $80.00 delivered Atlantic seaboard duty-paid

Domestic Prices at Works or Furnace—

Last Reported

	£ s d		French Francs		Belgian Francs		Reich §§Mark
Fdy. pig iron, Si. 2.5	$20.30	4 19 0(a)	$15.54	679.30	$18.81	550	$25.20 63
Basic bess. pig iron	18.50	4 12 6(a)	.....	....	.....	...	27.80 (b) 69.50
Furnace coke	4.60	1 4 2	5.15	225	6.91	202	7.60 19
Billets	29.50	7 7 6	23.36	1,029	29.41	860	38.60 96.50
Standard rails	1.68c	9 10 0	1.45c	1,405	2.20c	1,375	2.38c 132
Merchant bars	2.05c	11 12 0††	1.35c	1,304	1.76c	1,100	1.98c 110
Structural shapes	1.84c	10 8 0††	1.31c	1,268	1.76c	1,100	1.93c 107
Plates, †¼-in. or 5 mm	1.94c	10 19 3††	1.67c	1,650	2.20c	1,375	2.29c 127
Sheets, black	2.61c	14 15 0§	1.99c	1,958‡	2.52c	1,575‡	2.59c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	3.05c	17 5 0	2.94c	2,850	4.32c	2,700	6.66c 370
Plain wire	3.45c	19 10 0	2.03c	2,000	2.64c	1,650	3.11c 173
Bands and strips	2.12c	12 7 0††	1.49c	1,444	2.08c	1,300	2.29c 127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed. ††Rebate of 15s on certain conditions.

**Gold pound sterling not quoted. §§Last prices, no current quotations.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; †indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1	†12.00
Bos. dock No. 1 exp.	14.50-15.00
New Eng. del. No. 1	15.00-15.50
Buffalo, No. 1	16.00-16.50
Buffalo, No. 2	14.00-14.50
Chicago, No. 1	15.50-16.00
Chicago, auto, no alloy	14.00-14.50
Chicago, No. 2 auto	13.75-14.25
Cincinnati, dealers	12.50-13.00
Cleveland, No. 1	14.50-15.00
Cleveland, No. 2	13.50-14.00
Detroit, No. 1	12.00-12.50
Detroit, No. 2	11.00-11.50
Eastern Pa., No. 1	18.50-19.00
Eastern Pa., No. 2	16.50-17.00
Federal, Ill.	13.00-13.50
Granite City, R. R.	13.00-13.50
Granite City, No. 2	12.00-12.50
Los Angeles, No. 1	12.50-13.00
Los Angeles, No. 2	11.50-12.00
L. A., No. 1 f.a.s.	15.00-16.00
L. A., No. 2 f.a.s.	14.00-15.00
N. Y. dock No. 1 exp.	14.00
Pitts., No. 1 (R. R.)	20.00-20.50
Pittsburgh, No. 1	19.50-20.00
Pittsburgh, No. 2	18.00-18.50
St. Louis, R. R.	12.50-13.00
St. Louis, No. 2	12.50-13.00
San Francisco, No. 1	12.50-13.00
San Francisco No. 2	11.50-12.00
Seattle, No. 1	11.00-12.00
Toronto, dlrs. No. 1	9.25- 9.75
Valleys, No. 1	15.00-15.50

COMPRESSED SHEETS

Chicago, factory	14.50-15.00
Chicago, dealers	13.00-13.50
Cincinnati, dealers	12.00-13.00
Cleveland	14.00-14.50
Detroit	13.75-14.25
E. Pa., new mat.	18.50-19.00
E. Pa., old mat.	14.50-15.00
Los Angeles	11.00-11.50
Pittsburgh	19.50-20.00
St. Louis	11.00-11.50
San Francisco	11.00-11.50
Valleys	14.75-15.25

BUNDLED SHEETS

Buffalo, No. 1	14.00-14.50
Buffalo, No. 2	12.50-13.00
Cleveland	11.75-12.25
Los Angeles	14.00
Pittsburgh	18.00-18.50
St. Louis	10.00-10.50
Toronto, dealers	8.00- 8.50

SHEET CLIPPINGS, LOOSE

Chicago	9.50-10.00
Cincinnati, dealers	8.00- 8.50
Detroit	10.00-10.50
†Los Angeles	3.75- 4.00
St. Louis	9.00- 9.50
Toronto, dealers	4.25- 4.75

BUSHELING

Buffalo, No. 1	14.00-14.50
Chicago, No. 1	14.00-14.50
Cincin., No. 1, deal.	8.00- 8.50
Cincinnati, No. 2	3.00- 3.50
Cleveland, No. 2	9.00- 9.50
Detroit, No. 1, new	12.75-13.25
Valleys, new, No. 1	14.75-15.25
Toronto, dealers	3.75- 4.25

MACHINE TURNINGS (Long)

Birmingham	†4.50- 5.00
Buffalo	9.00- 9.50
Chicago	8.00- 8.50
Cincinnati, dealers	5.50- 6.00
Cleveland, no alloy	7.50- 8.00
Detroit	7.50- 8.00
Eastern Pa.	11.00-11.50
Los Angeles	5.00
New York	†6.50- 7.00
Pittsburgh	11.50-12.00
St. Louis	5.50- 6.00
San Francisco	5.00
Toronto, dealers	4.25- 4.75
Valleys	9.50-10.00

SHOVELING TURNINGS

Buffalo	10.00-10.50
Cleveland	9.50-10.00
Chicago	9.00- 9.50
Chicago, spcl. anal.	9.00- 9.50
Detroit	8.50- 9.00
Pitts., alloy-free	14.50-15.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	3.50
Buffalo	8.00- 8.50
Cincinnati, dealers	4.00- 4.50
Cleveland	9.00- 9.50
Eastern Pa.	10.50-11.00
Detroit	7.50- 8.00
New York	†3.50- 4.00
Pittsburgh	10.50-11.00
Toronto, dealers	3.50- 4.00

AXLE TURNINGS

Buffalo	11.00-11.50
Boston district	†8.50- 9.00
Chicago, elec. fur.	15.00-15.50
East. Pa. elec. fur.	15.00-16.00
St. Louis	10.00-10.50
Toronto	4.00- 4.25

CAST IRON BORINGS

Birmingham	†6.00- 6.50
Boston dist. chem.	†4.75
Buffalo	8.00- 8.50
Chicago	8.50- 9.00
Cincinnati, dealers	4.00- 4.50
Cleveland	9.00- 9.50
Detroit	7.50- 8.00
E. Pa., chemical	10.00-11.00
New York	†3.50- 4.00
St. Louis	5.00- 5.50
Toronto, dealers	3.75- 4.25

RAILROAD SPECIALTIES

Chicago	16.75-17.25

ANGLE BARS—STEEL

Chicago	18.00-18.50
St. Louis	15.50-16.00

SPRINGS

Buffalo	17.00-17.50
Chicago, coil	18.00-18.50
Chicago, leaf	17.50-18.00
Eastern Pa.	20.00-21.00
Pittsburgh	23.00-23.50
St. Louis	18.50-19.00

STEEL RAILS, SHORT

Birmingham	†12.00-12.50
Buffalo	18.00-18.50
Chicago (3 ft.)	18.50-19.00
Chicago (2 ft.)	19.00-19.50
Cincinnati, dealers	18.50-19.00
Detroit	18.50-19.00
Los Angeles	15.00-15.50
Pitts., 3 ft. and less	23.00-23.50
St. Louis, 2 ft. & less	17.00-17.50

STEEL RAILS, SCRAP

Boston district	†13.50-14.00
Buffalo	16.50-17.00
Chicago	16.00-16.50
Cleveland	20.00-20.50
Pittsburgh	21.00-21.50
St. Louis	16.00-16.50
Seattle	16.00

FROGS, SWITCHES

Chicago	15.50-16.00
St. Louis, cut	16.00-16.50

ARCH BARS, TRANSOMS

St. Louis	15.50-16.00

PIPE AND FLUES

Chicago, net	11.00-11.50
Cincinnati, dealers	7.25- 7.75

RAILROAD GRATE BARS

Buffalo	10.00-10.50
Chicago, net	9.00- 9.50
Cincinnati, dealers	7.00- 7.50
Eastern Pa.	15.00
New York	†10.50
St. Louis	10.00-10.50

RAILROAD WROUGHT

Birmingham	†11.00-11.50
Boston district	†9.50-10.00
Eastern Pa., No. 1	18.00-18.50
St. Louis, No. 1	11.00-11.50
St. Louis, No. 2	13.50-14.00

FORGE FLASHINGS

Boston district	†9.25- 9.75
Buffalo	14.00-14.50
Cleveland	14.75-15.25
Detroit	11.50-12.00
Los Angeles	9.00
Pittsburgh	17.00-17.50

FORGE SCRAP

Boston district	†6.50
Chicago, heavy	18.00-18.50

LOW PHOSPHORUS

Cleveland, crops	17.50-18.00
Eastern Pa., crops	20.00-21.00
Pitts., billet, bloom, slab crops	24.00-24.50

LOW PHOS. PUNCHINGS

Buffalo	16.00-16.50
Chicago	18.00-18.50
Cleveland	16.50-17.00
Eastern Pa.	19.00-20.00
Pittsburgh	20.50-21.00
Seattle	15.00

RAILS FOR ROLLING

5 feet and over

Birmingham	†14.00-15.00
Boston	15.00-15.50
Chicago	18.50-19.00
New York	†15.00-15.50
Eastern Pa.	19.50-20.00
St. Louis	19.50-20.00

STEEL CAR AXLES

Birmingham	†15.00-16.00
Boston district	†14.50
Chicago, net	18.00-18.50
Eastern Pa.	20.50-21.00
St. Louis	19.00-19.50

LOCOMOTIVE TIRES

Chicago (cut)	18.00-18.50
St. Louis, No. 1	14.00-14.50

SHAFTING

Boston district	†16.00-16.50
New York	†17.00
Eastern Pa.	22.00-23.00
St. Louis, 1¼-3¾"	16.50-17.00

CAR WHEELS

Birmingham	†13.50-14.00
Boston dist., iron	†10.00
Buffalo, steel	17.00-17.50
Chicago, iron	15.50-16.00
Chicago, rolled steel	17.50-18.00
Cincin., iron, deal.	14.50-15.00
Eastern Pa., iron	17.50-18.00
Eastern Pa., steel	20.00-21.00
Pittsburgh, iron	19.50-20.00
Pittsburgh, steel	23.00-23.50
St. Louis, iron	17.00-17.50
St. Louis, steel	17.00-17.50

NO. 1 CAST SCRAP

Birmingham	†13.00-13.50
Boston, No. 1 mach.	†11.50-11.75
N. Eng. del. No. 2	14.50-15.00
N. Eng. del. textile	14.50-15.00
Buffalo, cupola	15.50-16.00
Buffalo, mach.	16.50-17.00
Chicago, agri. net	11.50-12.00
Chicago, auto net	14.50-15.00
Chicago, railroad net	13.00-13.50
Chicago, mach. net	14.50-15.00
Cincin., mach. deal.	13.75-14.25
Cleveland, mach.	19.00-19.50
Detroit, cupola, net	13.50-14.00
Eastern Pa., cupola	18.00-18.50
E. Pa., mixed yard	16.00
Los Angeles, net	13.00-13.50
Pittsburgh cupola	18.50-19.00
San Francisco, del.	12.50-13.00
Seattle	12.50-13.50
St. Louis, cupola	13.50-14.00
St. Louis, agri. mach.	15.00-15.50
St. L., No. 1 mach.	15.25-15.75
San Francisco	12.50-13.00
Toronto, No. 1, mach., net	12.00-12.50

HEAVY CAST

Boston dist. Break.	†11.25-11.75
New England, del.	14.50-15.00
Buffalo, break.	12.50-13.00
Cleveland, break, net	13.00-13.50
Detroit, auto net	13.50-14.00
Detroit, break	11.00-11.50
Eastern Pa.	17.50-18.00
Los Ang., auto, net.	13.50
New York, break.	†13.00-13.50
Pittsburgh, break	14.50-15.00

STOVE PLATE

Birmingham	†7.50- 8.00
Boston district	†8.00- 8.25
Buffalo	13.00-13.50
Chicago, net	9.50-10.00
Cincinnati, dealers	7.00- 7.50
Detroit, net	7.50- 8.00
Eastern Pa.	15.00
New York, fdy.	†10.00-10.50
St. Louis	10.00-10.50
Toronto dealers, net	6.50- 7.00

MALLEABLE

Birmingham, R. R.	†10.50-11.00
New England, del.	11.50-12.50
Buffalo	16.50-17.00
Chicago, R. R.	18.50-19.00
Cincin., agri., deal.	12.00-12.50
Cleveland, rail	19.25-19.50
Eastern Pa., R. R.	18.00-18.50
Los Angeles	15.00
Pittsburgh, rail	20.50-21.00
St. Louis, R. R.	15.50-16.00

Iron Ore

Lake Superior Ore

Gross ton, 51½ %

Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbessemer	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbessemer	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-9.25
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, c.i.f. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man.	nom.
No. Afr. low phos.	nom.
Swedish low phos.	nom.
Spanish No. Africa basic, 50 to 60%	nom.
Tungsten, short ton unit, duty pd.	nom.
N. F., fdy., 55%	$23.75
Chrome ore, 48% gross ton, c.i.f.	7.00
Molybdenum ores sulphide, per lb. molybdenum contained, f.o.b. mill	$23.00-24.00 0.75

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52%	nom.
So. African, 50-52%	nom.
Indian, 49-50%	nom.

—The Market Week—

Sheets, Strip

Sheet & Strip Prices, Page 132, 133

Pittsburgh—Production now is the main problem confronting sheet mills. Operations are being stepped up as rapidly as possible, currently being about 75 per cent. There are some rumors that hand mills may be placed in service to relieve the pressure. Almost all buyers have been in the market, specifying early delivery in most instances. Heaviest demand has been from the automotive industry. Expectations of some advance in sheet and strip prices have been quelled for the present with announcement by the leading interest that current quotations will prevail on business for shipment through the remainder of the year.

Cleveland—Sheet and strip mill schedules are becoming clogged as a result of recent heavy specifications. Part of this demand has been in anticipation of future requirements, although buyers in many cases seek prompt delivery. Automotive needs lead the upturn in consumption which, in general, has been well behind the expansion in domestic business.

Chicago — Consumption, orders and production are increasing. Large users have stepped up specifications against contracts placed at concessions last spring. Practically all types of consumers are participating in the better demand, although automotive interests continue one of the largest sources of business. Railroad requirements are expanding.

Boston—Sheet and strip buying is brisk, sellers in some instances turning down new orders which are considered speculative. Although prompt delivery is requested on the bulk of business, some tonnage will probably not be shipped until next quarter. Releases against old low-priced volume are heavy, the bulk of such business being specified. Strip mill operations are up, re-rollers in some instances being near capacity.

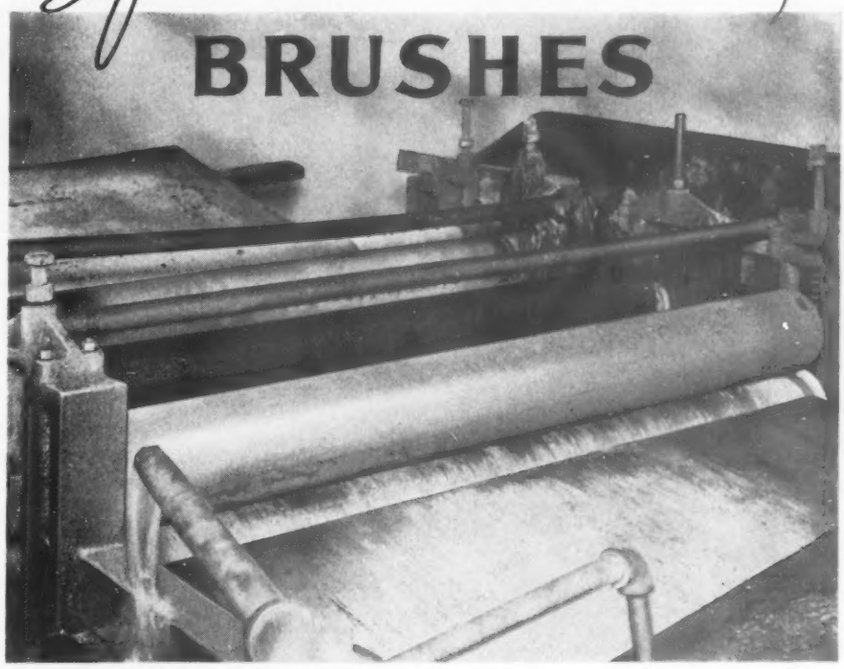
New York — Many buyers have placed substantial tonnages on the basis of price ruling at time of delivery. Deliveries on cold-rolled sheets are being extended rapidly, some producers being reported booked practically full for the remainder of the year. However, this is not general. A number of sellers no longer are accepting specifications against contracts placed last spring.

Philadelphia—Some mills are unable to promise sheet deliveries within seven weeks. On the other hand, at least one mill has some excess hot-rolled capacity available for late September. Consumer inventor-

"EVEN TRIM"

Spiral Wound

BRUSHES



—Step Up Production

—Cut Finishing Costs

—Insure A Better Profit

TURN to "Even Trim" Spiral Wound Brushes and obtain uninterrupted production and a smoother, better finish for light gauge steel and continuous strip tin plate.

Spiral Wound Brushes are made of nickel-steel wire, horsehair or tampico. There's a type for every wanted finish. And for economy and efficiency they're *refillable*.

Let one of our engineering representatives work out the Spiral Wound Brushes for your specific needs. Write or telephone—today.

PITTSBURGH

PLATE GLASS COMPANY

BRUSH DIVISION · BALTIMORE, MD.

ies generally are low despite large purchases ten weeks ago.

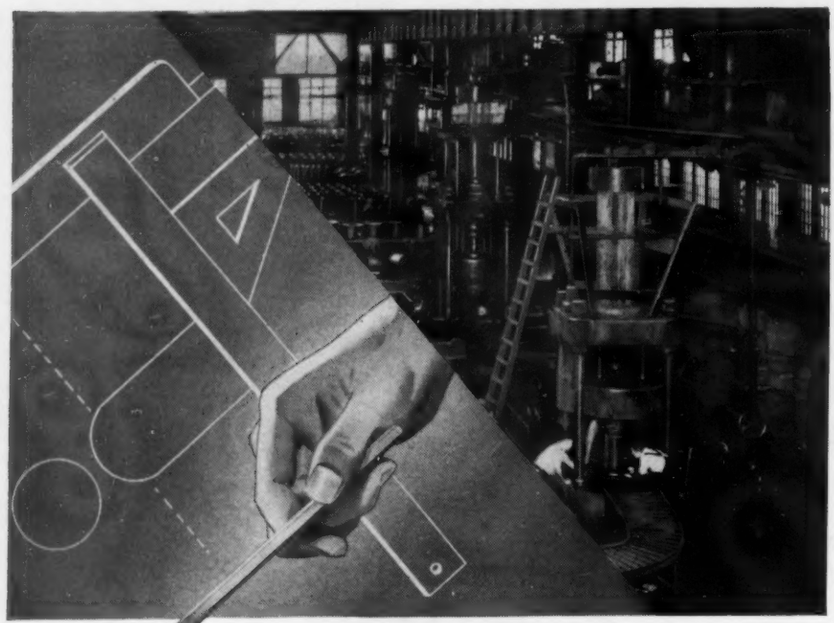
Despite reaffirmation of prices on hot and cold-rolled sheets, it is believed here galvanized will be advanced, because of the sharp rise in zinc quotations. Bookings the past few days have been heavy.

Buffalo — The buying stampede has boosted sheet and strip production by some mills to capacity. Buying is coming from a variety of sources, with a fair volume of automotive business included. Warehouses in some instances report difficulty in obtaining the amount of tonnage sought.

Cincinnati—Shipments are heavier, the result of larger specifications from automotive and miscellaneous industries. Mills have been cautious in accepting business in order to assure deliveries to regular customers who have rushed to cover apparent needs as well as anticipated requirements later in the year. Foreign inquiries are heavy.

St. Louis — Purchasing of sheets has been the feature in the large steel buying movement the past ten days. Specifications have been the best so far this year, and orders and inquiries are large. While mills are able for the most part to make fairly prompt deliveries, shipments have been retarded by lack of box cars.

Birmingham, Ala.—Sheets have shown little change although output is consistently high. Some gradual pick-up in output of cotton ties, major strip item here, also is evident.



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DESIGNING AND MANUFACTURING FACILITIES
to reduce your costs

If your product requires deep drawn shapes or shells you can probably save time and money by utilizing Hackney's unique designing, engineering and manufacturing facilities. Many manufacturers have benefited by the Pressed Steel Tank Company's more than 35 years' experience in the development and production of special shapes and containers for gases, liquids and solids.

This organization pioneered the cold drawing of seamless containers from metal plates. Where welding is desirable, the Hackney method has won recognition for its superiority. Positive control of heat-treating, X-ray inspection of welding and numerous other Hackney procedures permit the production of better, more dependable products at lower cost.

Let Hackney engineers help you develop new shapes or shells or improve on those now being used. There is no obligation and it may mean big savings.

Just send the details—or write for additional information.

PRESSED STEEL TANK COMPANY

208 S. La Salle St., Rm. 1211, CHICAGO
688 Roosevelt Building, LOS ANGELES
1387 Vanderbilt Concourse Bldg., NEW YORK
1461 S. 66th Street, MILWAUKEE

DEEP DRAWN SHELLS AND SHAPES

Plates

Plate Prices, Page 132

Chicago—Plates are more active as a result of increased domestic demand and because of foreign interest. Shipbuilding is a feature, and increased railroad needs are appearing in the form of freight car inquiries. Miscellaneous demand also is heavier. Prices are reported the firmest in many months.

Boston—Plate buying has improved slightly, but the rush to cover is not as heavy as might be expected, because of the lack of specified work requiring substantial tonnages. Shipyard specifications are steady with some scattered improvement by boiler shops and makers of heating equipment. Few large tank jobs are up for estimates. Prices are firmer.

New York—Specifications have increased appreciably with a stiffening in prices. Demand is appearing principally from tank and boiler fabricators, railroads, machinery builders and warehouses. Shipbuilding is expanding sharply all along the eastern seaboard, resulting in heavier plate releases. Railroad orders are confined mostly to repair work, but several large freight car lists are pending.

Philadelphia — Reaffirmation of plate prices is disappointing to non-integrated eastern plate mills, since higher costs already are being incurred. Pending plate business is the heaviest in years. Pennsylvania railroad will require a minimum of 80,000 tons of plates, shapes, sheets and bars for its equipment program, and the total may run as high as 100,000 tons. In addition to this program, it is understood the Pennsylvania will repair 1100 locomotives, for which material already has been specified. Pending shipwork includes 152,000 tons for 33 C-2 and C-3 boats on which bids will be taken Sept. 19 and 20. Export business is more active, with the market up an additional $1 to 2.15c, f.a.s.

Birmingham, Ala.—Plates remain in consistent demand. Shipbuilding accounts for considerable tonnage

and a fair tonnage goes to tank manufacturers.

Seattle—The largest plate job awarded in this area in several weeks, went to Western Pipe & Steel Co., San Francisco, 1400 tons for the Mud Mountain dam penstocks, Washington state. New projects involving plates featured the market this week. Tacoma has called bids Sept. 25 for furnishing 7,945 feet of 30 inch enameled steel pipe, totaling about 500 tons.

San Francisco—Plate awards were the largest of any week so far this year and aggregated 14,650 tons, bringing the total to date to 50,164 tons as compared with 25,130 tons for the corresponding period in 1938. Consolidated Steel Corp., Los Angeles, was awarded five type C-1 cargo vessels for the United States maritime commission, involving 13,250 tons of plates in addition to 3975 tons of shapes, 575 tons of rivets and over 875 tons of pipe and boiler tubing.

Plate Contracts Placed

13,250 tons, five C-1 type cargo vessels for United States maritime commission, to Consolidated Steel Corp., Los Angeles.

1400 tons, penstocks Mud Mountain dam, Washington state, to Western Pipe & Steel Co., San Francisco; Guy F. Atkinson Co., San Francisco, general contractor.

1240 tons, tanks and towers, Procter & Gamble Co., Quincy, Mass., to Hammond Iron Works, Warren, Pa.

560 tons, Lackawack dam, Delaware aqueduct, New York, to Bethlehem Steel Co., Bethlehem, Pa.

370 tons, six oil tanks, New York Oil Storage & Transfer Co., Elizabeth, N. J., to Graver Tank & Mfg. Co., Catasauqua, Pa.

135 tons, steel pipe, Shore parkway, contract Ms-19-15—Queens county, New York, Alco products, New York.

Plate Contracts Pending

500 tons or more, 30-inch enameled steel pipe, for Tacoma, Wash.; bids Sept. 25.

350 tons, 24-inch diameter, ¾-inch water pipe for Bremerton, Wash.; bids in Sept. 13.

Unstated, welded oil storage tanks for Coulee project; bids to Denver, Sept. 20.

Bars

Bar Prices, Page 132

Cleveland — Bar producers have heavy backlogs of both carbon and alloy material. Specifications have been stimulated by the changes which become effective in extras next month as well as by expectation of higher base prices. Cold-finished bar producers have awaited establishment of hot-rolled bar quotations before instituting changes in quantity extras.

Chicago—Despite reaffirmation of base prices on hot-rolled carbon and alloy bars, buyers are anxious to be covered because of higher quantity and cutting extras which become effective next month. Business has originated from an even wider range of sources than prevailed earlier in the summer. Automotive demand is more prominent, while railroads also are more active.

Boston—Commercial steel bar demand has improved, hot carbon, cold finished and alloys sharing in the gains. Releases for shipment this month are substantial. Sellers in some instances had not been pressing for new business pending announcement of price reaffirmation. Small tool, forging and bolt and nut shops have generally stepped up consumption, and miscellaneous industrial demand from other sources has improved.

New York—Bar sellers continue to receive heavy specifications. Large tonnages were ordered for future shipment prior to the extension of

A 25-ton Whitcomb Diesel-mechanical locomotive at the Osborn plant of Wabash Portland Cement Company.

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WHITCOMB LOCOMOTIVES
SUBSIDIARY OF THE BALDWIN LOCOMOTIVE WORKS

current prices to fourth quarter delivery. Machine tool builders, automotive accessory manufacturers, railroads and government shops are particularly active.

Philadelphia — Demand shows a further sharp increase, with practically all types of consumers participating, including forging shops, tool and equipment builders and shipyards. Railroads also are more active. Warehouses have built up inventories to above normal, with some supplied into first quarter.

Birmingham, Ala.—Merchant bars have shown an upward tendency this week with most of the output in concrete reinforcing. Production currently is estimated at approximately 75 per cent.

Pipe

Pipe Prices, Page 133

Cleveland — Mills are declining business for extended forward delivery except at prices prevailing at time of shipment. This is a move to prevent accumulation of excessive backlogs when conditions may dictate higher prices. Resellers are taking a similar stand, with prices in resale markets stiffening. Producers are assured of heavy shipments of most types of tubular materials for a number of weeks.

Boston — Merchant steel pipe orders are more numerous and the aggregate volume being moved by resellers is heavier. Prices are also more stable. Cast pipe demand has slowed down, although releases against old orders and small lot purchases are well maintained. Wrought pipe buying is light, showing little change.

Birmingham, Ala. — Pipe plants, which slackened considerably three weeks ago, are experiencing some gain in inquiries, mostly from municipalities anxious to protect against possible delivery delays. Operations are currently at four days a week.

Seattle—New projects have developed, giving the market an improved outlook. Seattle opened bids Sept. 13 for about 600 tons of assorted sizes. Tacoma has set Sept. 25 for receiving bids for 1325 feet of 18-inch cast iron pipe, about 200 tons.

San Francisco—United States Pipe & Foundry Co. is low on 614 tons of 6 to 12-inch cast pipe for Burbank, Calif. Awards totaled 593 tons and brought the year's aggregate to 23,344 tons, compared with 23,099 tons for the same period last year.

Cast Pipe Placed

135 tons, Shore parkway, contract MS-39-15, Queens county, New York to Alco Products Inc., New York.

550 tons, McChord Field, Wash., to H. G. Purcell, Seattle, for U. S. Pipe & Foundry Co., Burlington, N. J.

185 tons, 6-inch, for Spokane, Wash., to H. G. Purcell, Seattle, for U. S. Pipe & Foundry Co., Burlington, N. J.

Cast Pipe Pending

600 tons, assorted sizes, for Seattle; bids in.

200 tons, 18-inch for Tacoma, Wash.; bids Sept. 25.

614 tons, 6 to 12-inch, Class 250, Burbank, Calif.; United States Pipe & Foundry Co., Burlington, N. J., low.

418 tons, 4 to 10-inch., Fresno, Calif.; bids opened.

Tin Plate

Tin Plate Prices, Page 132

Despite reaffirmation of prices for next quarter, tin plate buying has increased on the assumption there may be an increase later. Export demand is heavy, with prices holding after a rise of $6 a ton a week ago. The export market is the equivalent of about $5.25 per base

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box, f.a.s. Sellers are quoting f.o.b. mill, freight allowed.

The domestic market is somewhat abnormal, since a downward trend in demand is the usual trend at this time. Production has risen 8 points to 68 per cent, more than recovering last week's 4-point drop.

Wire

Wire Prices, Page 133

Cleveland — Wire business continues heavy, practically all types of buyers seeking protection against current or prospective increases in consumption. Expansion in automotive operations is an important factor in the better demand. Higher prices for agricultural commodities enhances the outlook for business in merchant products during the fall in rural areas. Current quotations on manufacturers' wire and wire rods are being extended to fourth quarter shipments, it has been announced by American Steel & Wire Co. Deliveries after Dec. 31 will take prices in effect at time of shipment.

Boston — Wire mill operations in most departments have stepped up sharply. Orders are heavy, the volume of business being offered mills being well in excess of current production. A sellers' market has developed and consumers in numerous instances are seeking to build up inventories or coverage on mill books.

Rails, Cars

Track Material Prices, Page 133

Rail buying last week was the heaviest since late January and mid-February, 115,000 tons being placed, some being in anticipation of 1940 programs, placed early to assure delivery when required. Chesapeake & Ohio has placed 32,000 tons, Louisville & Nashville 30,000 tons, Seaboard Air Line 5000 tons, Illinois Central 2000 tons, New York Central 5000 tons, Chicago, Rock Island & Pacific 12,000 tons and the Pennsylvania has inquired for 50,000 tons, at the same time releasing specifications for 30,000 tons bought last December.

Atlantic Coast Line has awarded 8500 tons of rails to Tennessee Coal, Iron & Railroad Co. Brazil is said to have placed 20,000 tons in this country, with probability of further purchase.

Leading freight cars award involved 2000 forty-foot all-steel box cars and 500 50-foot all-steel auto cars, placed by the Pennsylvania with its Altoona, Pa., shops. In addition, the Pennsylvania has placed chassis for 20 electric locomotives with its Altoona shops, with the electrical equipment to be placed later. Three streamlined passenger coaches are to be placed shortly.

The Pennsylvania also plans to repair 17,500 freight cars and 15 coaches during September and October, with its total program, including new rails and equipment, expected to cost $17,000,000.

Illinois Central has announced a carbuilding and repair program which includes 1500 coal cars in addition to 1000 box cars and 10 diesel switchers.

Delaware, Lackawanna & Western will rebuild 300 fifty-ton hopper cars at its Scranton, Pa., shops. The Wheeling & Lake Erie has requested faster deliveries on 500 freight cars, with a view to getting as much of this equipment in operation this year as possible. The Virginian has awarded construction of 500 all-steel hoppers to its own shops. Transportation commission, Seattle will issue specifications and ask bids this

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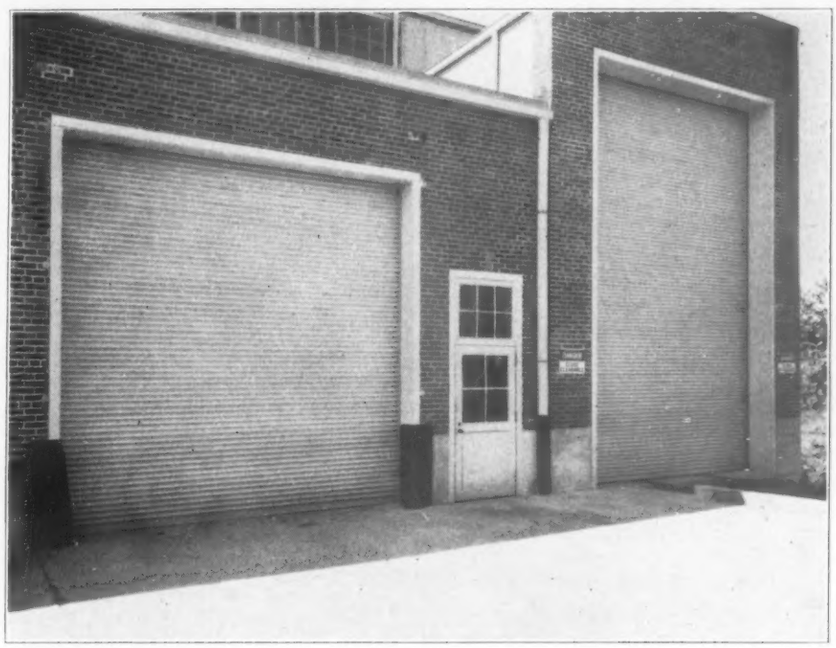

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week on 235 trackless trolleys and 102 motor coaches.

Canadian transport minister announces the government will buy new railway equipment to the value of $25,000,000 to be sold to Canadian Pacific and Canadian National on trust certificates. It will include some locomotives, the remainder box and long flat cars.

Locomotives Placed

Pennsylvania, 20 electric locomotives, with chassis to be built at Altoona shops and electrical equipment to be placed later.

Locomotives Pending

Illinois Central, 10 diesel-electric switchers.

Car Orders Placed

Pennsylvania, 2000 forty-foot steel box cars and 500 fifty-foot steel auto cars, to own shops, Altoona, Pa.

Virginian, 500 all-steel hopper cars, to own shops, Princeton, W. Va.

Rail Orders Placed

Chesapeake & Ohio, 32,000 tons 131-pound rails; 17,280 tons to Carnegie-Illinois Steel Corp., Pittsburgh; 11,520 tons to Inland Steel Co., Chicago; 3200 tons to Bethlehem Steel Co., Bethlehem, Pa.

Chicago, Rock Island & Pacific, 12,000 tons; 7000 tons to Colorado Fuel & Iron Co., Denver; 5000 tons to Inland Steel Co., Chicago.

Illinois Central, 2000 tons, 112-pound, to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Louisville & Nashville, 30,000 tons, 100-pound, to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

New York Central, 5000 tons; 2500 tons to Carnegie-Illinois Steel Corp., Pittsburgh, 2000 tons to Bethlehem Steel Co., Bethlehem, Pa.; 500 tons to Inland Steel Co., Chicago.

Seaboard Air Line, 5000 tons, 100-pound, to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Atlantic Coast Line, 8500 tons to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Rail Orders Pending

Pennsylvania, 50,000 tons, plus accessories; distribution imminent; releases have been issued on 30,000 tons awarded in December.

Car Orders Pending

Transportation commission, Seattle, 235 trackless trolleys, 102 gas or diesel motor coaches 30 to 44 passenger; specifications ready Sept. 19.

Buses Booked

American Car & Foundry Motors Co., New York: Five for Rochester Transit Co., Rochester, N. Y.; one for Los Angeles Railway Corp., Los Angeles; one for Denver Tramways, Denver.

DAMASCUS

Manganese and Alloy Steel CASTINGS

FROM ½ TO 1000 POUNDS

1906 — 33 years — 1939

Produced in our modernly equipped foundry from electric furnace steel and heat-treated in automatically controlled gas-fired furnaces.

We are in position to manufacture specialties made of manganese and alloy steel castings and invite concerns to write us about their requirements.

DAMASCUS STEEL CASTING CO.
New Brighton, Pa.
(Pittsburgh District)

Shapes

Structural Shape Prices, Page 132

Chicago — Fabricated shape demand is rather quiet, although a fairly large tonnage is pending. New inquiries locally are scant. Some fear is expressed government money may be diverted from structural projects to ordnance channels. Recent awards include 550 tons for a bakery here.

Philadelphia—A number of projects which had been delayed now are approaching the active stage. Mill inventories of plain material still are substantial. Prices are firm

Shape Awards Compared

	Tons
Week ended Sept. 16	47,130
Week ended Sept. 9	13,816
Week ended Sept. 2	23,897
This week, 1938	74,830
Weekly average, year, 1938	21,568
Weekly average, 1939	22,620
Weekly average, August	18,739
Total to date, 1938	726,833
Total to date, 1939	836,891

Includes awards of 100 tons or more.

on fabricated material but still are under the published equivalents.

Seattle—Largest contract immediately pending is for the Washington state steel truss bridge over the Lewis river, bids Sept. 26, involving 1455 tons. Tri-State Construction Co., Portland, has the general contract at $149,388 for erection of a cell block at the Walla Walla, Wash., state prison and jail equipment for the same project went to King Bros., Portland, Oreg.

St. Louis — While lettings have been scant, inquiries have increased markedly the past ten days. Fabricators are working an average of 35 to 40 per cent of capacity.

San Francisco — Structural shape awards were the second largest of any week this year, 7316 tons, bringing the total to date to 97,826 tons, compared with 98,055 tons for the corresponding period in 1938.

Shape Contracts Placed

18,000 tons, piling, Gilbertsville dam, Kentucky, for TVA to Inland Steel Co., Chicago.

3975 tons, five C-1 type cargo vessels for United States maritime commission, to Consolidated Steel Corp., Los Angeles.

2000 tons, building, Hill Bros. Coffee Co., Edgewater, N. J., to Bethlehem Fabricators Inc., Bethlehem, Pa., through Austin Co., New York.

1935 tons, transmission towers, Public Service Co. of Indiana, New Castle, Ind., to American Bridge Co., Pittsburgh.

1915 tons, contract S3, State street subway, Chicago, to American Bridge Co., Pittsburgh.

1855 tons, contract D1, Dearborn street subway, Chicago, to American Bridge Co., Pittsburgh.

1650 tons, power house, Public Service Electric & Gas Corp., Burlington, N. J., to Lehigh Structural Steel Co., Allentown, Pa.

1580 tons, Tiffany building, Fifty-seventh street and Fifth avenue, New York, to Bethlehem Steel Co., Bethlehem, Pa., through Turner Construction Co., general contractor.

1010 tons, Buzzard's Point station, Potomac Electric Power Co., Washington, to American Bridge Co., Pittsburgh.

1000 tons, grade separation MS-391.15, Brooklyn, for city of New York, to American Bridge Co., Pittsburgh.

775 tons, Bridge of the Gods, Columbia River, Oregon; 465 tons to Schmidt Steel Co., Portland, Oreg., 310 tons to Willamette Iron & Steel Co., same city.

682 tons tunnel supports, relocation of Southern Pacific railroad, Central Valley project, Calif., to unnamed interests.

610 tons, bridge 1842, Miami county, Peru, Ind., to Pan-American Bridge Co., New Castle, Ind.

550 tons, turbine and boiler foundations, Consolidated Edison Co., New York, to American Bridge Co., Pittsburgh.

540 tons, including 150 tons of sheet piling, Lankershim boulevard bridge, Los Angeles, to Bethlehem Steel Co., Los Angeles.

525 tons, steam plant, Public Utilities Engineering & Service Corp., LaCrosse, Wis., to Milwaukee Bridge Co., Milwaukee, Wis.

500 tons, state bridge FAGH-8529, Rockville, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

465 tons, new factory for Northrop Aircraft Inc., Hawthorne, Calif., to Bethlehem Steel Co., Los Angeles.

460 tons, grade separation, Black Creek-Belfast, Allegany county, New York, to Bethlehem Steel Co., Bethlehem, Pa., through E. W. Foley Inc., Brooklyn, N. Y.

460 tons, state highway bridge FAGH 8529, Allegany county, New York, to Bethlehem Steel Co., Bethlehem, Pa.

400 tons, reconstruction of culvert MS-39-9A, Rapid Transit railroad, Brooklyn, for city of New York, to Bethlehem Steel Co., Bethlehem, Pa.

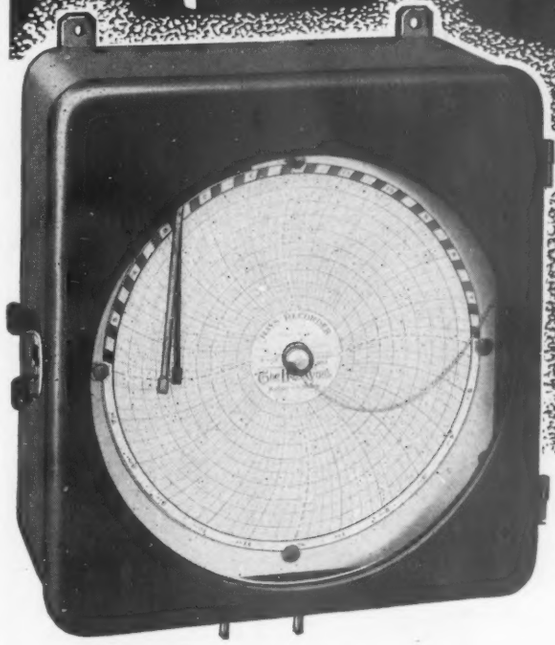
397 tons, sheet steel piling, bureau of reclamation, invitation B-42,293-B, for delivery at Niland, Calif., to Inland Steel Co., Chicago.

370 tons, extension to storehouses 2 and 4, for United States navy, Bellevue, D. C., to Lehigh Structural Steel Co., Allentown, Pa.

300 tons, state bridge FA-824-A, Linn Grove, Iowa, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

286 tons, conveyor system for Columbia Construction Co., Shasta dam, Central Valley project, Calif., to Consolidated

Super-Sensitive



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Instrument cases are of either cast iron or aluminum—to resist corrosion in different atmospheres. HAYS "OT" Recorders are built husky enough to withstand dirt-laden air and severe operating conditions yet sensitive enough to register accurately increments of .0025 of an inch water. They are built to meet your particular operating requirements. Write to 960 Eighth Avenue, Michigan City, Indiana, for more detailed information.

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Steel Corp., Los Angeles.

285 tons, bridge FAP-45 (3), Kalovusha county, Mississippi, to Virginia Bridge Co., Roanoke, Va.

275 tons, state bridge, contract 1844, Oakland City, Ind., to American Bridge Co., Pittsburgh.

265 tons, curbing, East River drive, contract 12C, New York, to Phoenix Iron Co., Phoenixville, Pa.

260 tons, plant addition, Consolidated Water & Power Co., Wisconsin Rapids, Wis., to Wisconsin Bridge & Iron Co., Milwaukee, Wis.

260 tons, plant, Goodyear Rubber Co., St. Mary's O., to an independent fabricator.

225 tons, Roosevelt library, Hyde Park, N. Y., to Bethlehem Steel Co., Bethlehem, Pa., through John McShain Inc., Philadelphia.

220 tons, state bridge RC-4032 and RC-4033, Goshen, N. Y., to Harris Structural Steel Co., New York.

210 tons, bridge, section 14A, Bedford county, Pennsylvania, to American Bridge Co., Pittsburgh.

210 tons, annexes to hangars, Ft. Lewis, Wash., for United States army, to Poole & McGonigle, Portland, Oreg.

200 tons, apartment building, River Forest, Ill., for River Forest Garden Apartment Corp., to Harrison Iron Works, Chicago.

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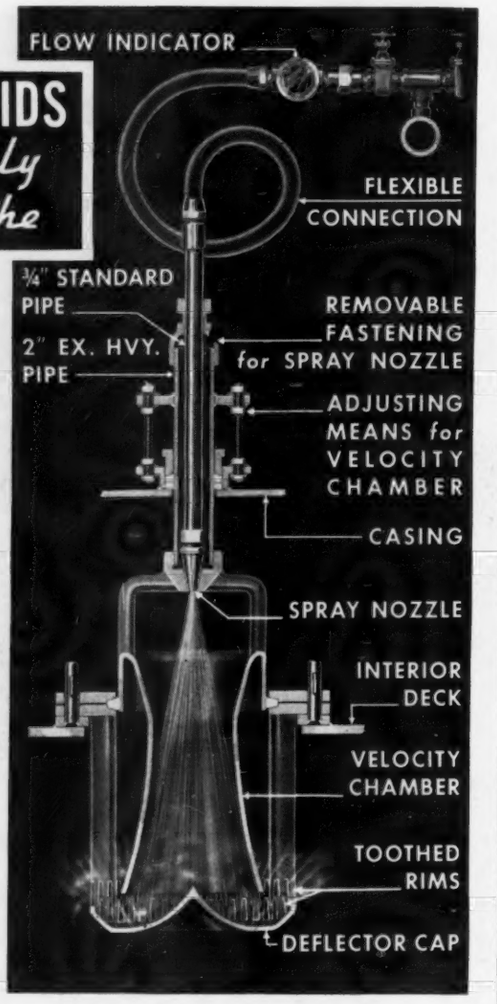
BRASSERT
STATIONARY DISINTEGRATOR



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310 South Michigan Avenue, CHICAGO, ILLINOIS
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190 tons, state bridge FAS-133-A (1), Dover Plains, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

190 tons, bridge 26 FAS-95A (1), Ellis county, Kansas, to St. Joseph Structural Steel Co., St. Joseph, Mo.

185 tons, bridge FA-83-1 (2), Newton county, Missouri, to Kansas City Structural Steel Co., Kansas City, Mo.

160 tons, addition to plant, for National Lead Co., Sayreville, N. J., to Savary & Glaeser.

160 tons, Brownell school Chicago, to A. F. Anderson Iron Works, Chicago.

150 tons, addition to service building 1, for Atchison, Topeka & Santa Fe railroad, Chicago, to Hansell-Elcock Co., Chicago.

150 tons, contract MS-39-5, Shore parkway, Brooklyn, to American Bridge Co., Pittsburgh.

145 tons, cell block, prison, Green Haven, N. Y., to Belmont Iron Works, Philadelphia.

140 tons, railroad track and trestle, Kings Park, N. Y., for state, to Bethlehem Steel Co., Bethlehem, Pa.

120 tons, garage building, for Michigan Bell Telephone Co., Detroit, to Bethlehem Steel Co., Bethlehem, Pa.

120 tons, state bridge FAP-81-A (2), Canyon Diablo, Ariz., to Minneapolis-Moline Power Implement Co., Minneapolis.

120 tons, bridge FAP-210 and 4300, Grant county, Wisconsin to Theodore Kupfer Iron Works.

120 tons, bridge 1841, Porter county, Valparaiso, Ind., to American Bridge Co., Pittsburgh.

115 tons, state bridge over US-131, Fife Lake, Mich., to R. C. Mahon Co., Detroit.

110 tons, store and apartment, 1307 Sixth avenue, New York, to Grand Iron Works, New York.

105 tons, crane runway, Federal Portland Cement Co., Woodlawn, N. Y., to Lackawanna Steel Construction Co., Buffalo.

100 tons, Quaker City garage, Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa.

100 tons, bridge, contract 1821, Hobart, Ind., to American Bridge Co., Pittsburgh.

Unstated, jail equipment, Walla Walla, Wash., state prison, to King Bros., Portland, Oreg.

Unstated, fish screens, Pishkun reservoir, Montana, by bureau of fisheries, to Caird Engineering Works, Helena, Mont.

Unstated, addition to cell block, Walla Walla, Wash., state prison; Tri-State Construction Co., Portland, general contractor.

Shape Contracts Pending

3000 tons, Main avenue bridge ramp over West Third street, Cleveland, for Cuyahoga county, Ohio.

1700 tons, bridge, Louisville, Ky., for Pennsylvania and Illinois Central railroads.

1455 tons, steel truss state bridge, Lewis River, Washington; bids at Olympia, Sept. 26.

1300 tons, building, Northam-Warren Co., Stamford, Conn.

1000 tons, warehouse, Lit Bros. depart-

ment store, Philadelphia; bids Sept. 25.

1000 tons, remodeling boilerhouse, Philadelphia Electric Co., Chester, Pa.; bids Sept. 25.

900 tons, mill building, Copperweld Steel Co., Glassport, Pa.

700 tons, process building, for Procter & Gamble Co., Quincy, Mass.

700 tons, state highway bridge, Cattaraugus county, New York; bids Sept. 20.

665 tons, bridge, route 6, section 12, Passaic river, Montville township, New Jersey; bids Sept. 29.

650 tons, bridges route 6, section 20, New Jersey highway; bids Sept. 29; includes 108 tons bars.

600 tons, office and warehouse, for Potter-McCune Co., McKeesport, Pa.

500 tons, apartment building, Jackson Heights, N. Y.

500 tons, building for Pennsylvania Bell Telephone Co., Philadelphia; bids Sept. 27.

450 tons, state bridge, Wray, Colo.

300 tons, state highway projects, Missouri, including 115 ton bridge in Howell county; Carte-Harlin Construction Co., West Plains, Mo., general contractor.

262 tons, girder bridge, Carbon county, Wyoming; bids Sept. 19.

243 tons, Arickaree river bridge, Yuma county, Colorado; bids opened.

230 tons, state highway bridge, Delaware county, New York; bids Sept. 20.

225 tons, Russian river bridge, Mendocino county, California, for state; bids opened.

200 tons, state bridge over Chagrin river, Cuyahoga and Geauga counties, Ohio.

125 tons, power plant, Parker dam project, Arizona; bids Sept. 22.

125 tons, building 120, Massena, N. Y., for Aluminum Co. of America, New York.

Reinforcing

Reinforcing Bar Prices, Page 133

Pittsburgh—Prices are strong and mills are jammed with business, making delivery a factor in placing of new business. Pending tonnage is sustained, although new inquiries are somewhat lighter. Demand is not influenced by the war situation in that there has been no foreign business of consequence.

Chicago—Large lots are absent among awards and new inquiries. Expectations of higher prices have induced the placing of substantial orders for stock.

St. Louis—Bids will be opened by Missouri Sept. 22 for highway projects requiring about 500 tons of reinforcing bars and mesh. Illinois highway activities have virtually halted since Aug. 1 because of the wage and hour law.

San Francisco—Reinforcing bar awards were not particularly large but pending business exceeds 11,500 tons. Awards totaled 1780 tons and brought the aggregate for the year to 118,179 tons, compared with 95,631 tons for the same period a year ago. K. E. Parker Co., San Francisco, secured the general contract for a power plant and storehouse at the naval air base, Alameda, Calif., involving 1575 tons.

Seattle—While no large tonnages are in the market, prices are firm and higher levels are not unlikely.

Concrete Bars Compared

	Tons
Week ended Sept. 16	2,450
Week ended Sept. 9	13,750
Week ended Sept. 2	13,046
This week, 1938	12,823
Weekly average, year, 1938	6,959
Weekly average, 1939	9,692
Weekly average, August	7,894
Total to date, 1938	245,063
Total to date, 1939	358,595

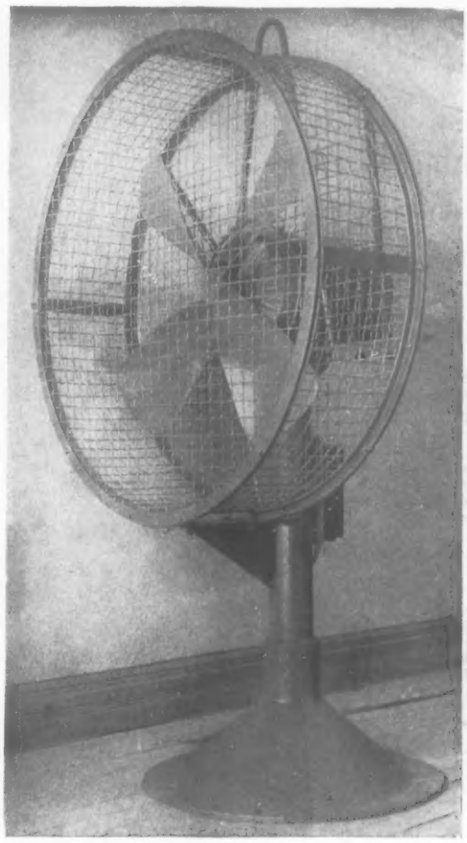
Includes awards of 100 tons or more.

Reinforcing Steel Awards

1100 tons, municipal hospital, Pittsburgh, to Jones & Laughlin Steel Corp., Pitts-

COOL

WORKERS *are* BETTER WORKERS



Aside from the purely enervating effects of heat, a perspiring worker is frequently a handicap to accurate production, even if it is slow. Leading steel plants have installed TRUFLO PORTABLE COOLING FANS, particularly in and around skelp furnaces, bar mills, tube mills, heat-treating furnaces and other localities where intense heat prevails. TRUFLO FANS keep the men comfortable and on their toes, and help them to do normal work in spite of the thermometer. Man can live in a temperature range of 200 degrees Fahrenheit, but his best work is performed within a range of 30 degrees F. Efficiency and production depend on favorable working conditions, and TRUFLO PORTABLE COOLERS condition working men. A complete line of cooling fans, blowers, exhaust fans and wall fans.

Write at once for information

TRUFLO FAN COMPANY

HARMONY, PA. PITTSBURGH DISTRICT

burgh, through Metzger-Richardson Co., Pittsburgh; Fleisher Engineering & Construction Co., contractor.

1050 tons, dam, Franklin Falls, N. H., to Truscon Steel Co., Youngstown, O., through Coleman Bros. Corp., Boston.

200 tons, school and gymnasium, Brockport, N. Y., to Buffalo Steel Co., Conawanda, N. Y.; Grosline & Swan, contractors.

100 tons, telephone exchange building, Bay City, Mich., to Truscon Steel Co., Youngstown, O.; Spence Bros., contractors.

Reinforcing Steel Pending

1575 tons, power plant and store house, naval air base, Alameda, Calif.; general contract to K. E. Parker Co., 135 South Park, San Francisco, at $845,221.

1000 tons, grade elimination, Louisville, Ky., Pennsylvania railroad; bids Sept. 18.

930 tons, invitation 631-40-56, United States engineer office, for delivery at Wiota, Mont.; bids opened.

538 tons, Panama canal, schedule 3589; bids Sept. 15.

500 tons, state highway projects, Missouri; bids Sept. 22.

445 tons, Lewis river bridge, Washington state, bids at Olympia, Sept. 26.

300 tons, addition to Lebanon hospital, Los Angeles; bids being taken.

272 tons, Potrero Hill housing plan, San Francisco; bids Sept. 26.

265 tons, Loyalhanna dam, Saltsburg, Pa.; Great Lakes Dredge & Dock Co., low bidder.

150 tons, underpass, East Ninth street, Cleveland.

135 tons, miscellaneous Washington state highway projects; bids at Olympia, Sept. 26.

132 tons, highway work in Cochise county, Arizona, for state; bids opened.

118 tons, treasury department, for Sonoma county, California; bids opened.

117 tons, specification 8614, roads for naval air base, Alameda, Calif.; general contract to Eaton & Smith, 715 Ocean street, San Francisco.

110 tons, bridge, route 6, section 12, Passaic river, Montville township, New Jersey; bids Sept. 29.

109 tons, highway work in Amador, Mendocino and Humboldt county, Calif., for state; bids Sept. 20.

SPECIFY "*Standard*" FOR QUALITY

Forged Carbon Steel Lifting Swivel. Weight 10,400 lb.

UNUSUAL FORGINGS

Forgings of unusual size or character are nothing new for "Standard." Such work constitutes a regular and well-established part of the business.

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WROUGHT STEEL WHEELS

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District Offices
NEW YORK CHICAGO ST. LOUIS SAN FRANCISCO PORTLAND, ORE.

Pig Iron

Pig Iron Prices, Page 134

Cleveland—Orders and shipments have spurted sharply here, the upturn in business being partly in anticipation of the increase of $2 a ton announced late last week. September deliveries are expected to double those of August. Movement of foundry coke also has increased, indicative of increase in the melt, although the gain has been less than in pig iron. Expanding automotive operations account for a large share of the increased consumption.

Chicago—Heavy bookings preceded the advance of $2 a ton in principal pig iron grades last week. In some cases orders were taken at prices prevailing at time of shipment. In addition to the increase on foundry, basic and bessemer iron, Michigan charcoal iron producers also raised quotations $2, and the Lyles, Tenn., furnace moved up its prices $3 a ton on both grades of high and low phos semi-cold blast charcoal iron. The new figures will apply on business taken for fourth quarter delivery but are not guaranteed against further revision between now and the end of the year.

New York—Eastern sellers have advanced pig iron $2 a ton. Higher prices are quoted only on definite specifications for shipment over the remainder of the year, sellers refusing all options. However, consumers have covered rather extensively at unchanged prices on such tonnage they think they will require through fourth quarter.

Boston—Advance of $2 a ton in pig iron prices has stimulated inquiry and buying, but producers are

reluctant to cover too far in advance, attempting to hold shipments to specifications actually required. Foundry melt is up slightly. Several of the larger consumers with substantial stocks still on hand are attempting to bolster inventories further.

Philadelphia — Eastern sellers booked thousands of tons prior to the advance of $2 a ton last Wednesday. Most foundries are believed well covered through fourth quarter, if not beyond, at old prices. The report that Japan has placed a large tonnage is not confirmed.

Buffalo—Consumers have flooded sellers with releases and placed heavy new commitments prior to the advance of $2 a ton. Shipments have increased in all directions. Increased consumption is preventing excessive additions to foundry stocks. Pig iron production has been raised to 70 per cent of capacity in this district.

Cincinnati—Most foundries covered estimated requirements through the remainder of the year at prices in effect before the $2 increase announced last week. Tonnage must be taken out during the coming quarter to avoid application of this advance. Shipments have increased about 25 per cent so far this month, with the melt showing moderate improvement.

St. Louis — September pig iron shipments give indications of being the largest since early 1937. Substantial orders were booked at the recent market prior to the advance in prices. Melters of both basic and foundry iron are anxious to take shipments against contracts. Rising scrap prices are a factor in stimulating pig iron movement.

Toronto, Ont.—Business continues brisk as melters either have covered for next quarter or are inquiring regarding future needs. This is in contrast to previous practice of making only spot purchases, and is the result of fears of lighter supplies under increased war needs. Action on prices is expected shortly. A British munitions board will be established in Canada soon for placing munitions orders.

Refractories

Refractories Prices, Page 134

New York — Refractory makers are expected to open books for fourth quarter this week. An advance is expected in some quarters, as demand is expanding and costs have already shown an increase. Prices have been steady for many months.

Scrap

Scrap Prices, Page 136

Pittsburgh — Prices soared last week, heavy melting steel moving up $3 a ton to a new high for the year at $19.50 to $20.00 for No. 1. Mill offers of $18 have been without takers. Brokers and dealers are picking up all available supplies. Consumer buying still is restricted by unwillingness of sellers to go short. Other grades have shared in the abrupt strengthening in prices.

Chicago—Prices have risen sharply, principal steelmaking grades being up $2. Mill buying continues light, the market rising largely on the basis of dealer-broker transactions. Some sellers are making no quotations on No. 1 steel, and the market for a number of grades is nominal. No. 1 steel currently may be quoted $15.50 to $16.

Boston—Practically all grades of iron and steel scrap for domestic and export deliveries have advanced 50 cents to $1. The rise in several

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SWITCH and BUS
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BELOW—Hi-Pressure Contact Outdoor Disconnecting Switch
RIGHT—Indoor Conductor Support Pipe Mounting—flat bar conductor

RAILWAY AND INDUSTRIAL ENGINEERING CO.

GREENSBURG, PA. EASTERN POWER DEVICES LTD., TORONTO

SEE THEM AT THE IRON & STEEL EXPOSITION

Complete Equipment designed for the Steel Mill includes Conductor Supports, Conductor Spacers, Hi-Pressure Contact Disconnecting Switches (standard and heavy duty), Design, Fabrication and Erection of Outdoor Sub-Stations, including Bus and Switching Equipment.

Behind the Scenes with STEEL

Author! Author!

■ The Chicago chapter of the American Foundrymen's association is all set for its annual stag outing and golf party this next Saturday at beautiful Lincolnshire Country club—"with its luxurious club house, its tranquil terrain, its sunny swards and its atmosphere of cordial camaraderie" so the committee announcement reads. Literature lost a great artist when the author of this announcement took up foundry work because then he really gets warmed up: *As twilight dims the magic artistry of verdant field and foliage turning to crimson and gold, we'll wend our way to the big tent, and, with perhaps a nod or two to the Cup of Circe, proceed to sate our Gargantuan appetite with a menu which long will linger in our memories of Epicurean delices. After the Prize awards, and with our demi tasse and Coronas, comes the grand climax of a grand day—the Floor Show—an intriguing interlude of titillating tunes, jolly jocosity, tantalizing Terpsichores and pulsating pulchritude—the piece de resistance of the day!* Wonder what dat guy does nights?

Famous Statements

■ In two short weeks of war there have been statements made that will live long in history but none of them will have more punch than the remark by the salty captain of the CITY OF FLINT on arrival in this country with survivors of the ATHENIA disaster. He tossed off all compliments with a shrug and said: "Listen, there ain't no such thing as a hero. You're either a man or a bum!"

On The Run

■ The convention season is getting into full swing. This week at Ralph Hitz's busy Hotel New Yorker STEEL's advertising staff will sit down with advertising managers and agency men for the annual industrial advertisers' conference. At Pittsburgh's Hotel William Penn next Tuesday you'll find us proudly exhibiting a very snooty new booth at the Iron & Steel Engineers show which this issue so elaborately previews. We'll be up on the 17th floor on the way to the technical sessions and we'd like to have you stop in to say hello. And then it won't be long before the "bigger and better" Metal Show will get under way in Chicago's great International Ampitheater. And don't forget that next week STEEL brings you the most conveniently attended affair of the year—a complete machine tool show on paper.

High Spots

■ It's a real pleasure to welcome such new advertisers as American Blower Corp. with that very snappy looking spread this week and we certainly have to give Kemp of Baltimore a prime orchid for their four-pager following page 86. We don't mean to be partial because there's a lot more we could mention. Best bet for you is a careful page by page inspection.

One Side

■ These Englishmen are hard to get excited. Walter Winchell the other day mentioned a letter received from a British manufacturer explaining a change in plans because of a "spot of trouble" they're having over there now.

And The Other

■ On the other side of the channel they seem to find the spot of trouble a bit more serious. By cable, our good German subscribers have been cancelling all subscriptions *boom, boom, boom.*

Won't You Join Us?

■ The tap room up the street is elaborately advertising a 1c sale on beer. A dime for the first one and a penny for the second. We're taking all our friends there now, and as you may have guessed, we buy the second round.

SHRDLU

cast grades for delivery to New England points has been even greater. Buying and shipments to district consumers as well as to eastern Pennsylvania have increased, the Rhode Island steelworks buying No. 1 heavy melting steel at $15 to $15.50 delivered. The export situation is clearing and prices have gone 50 cents a ton higher, with more cargo space available.

New York—Prices are higher, including cast grades for rail delivery to eastern Pennsylvania. Most grades are up 50 cents to $1. Cargo space to meet export scrap shipments continues limited, and slowness in offerings has resulted in a $1 advance on heavy melting steel and most other grades for barge delivery.

Philadelphia—The market is the most chaotic in several years. Some mills are not too well covered, and dealers are holding their limited supplies for higher prices. Rumors that as high as $21 was paid for No. 1 steel are discounted, but the market is $1.50 higher. Export buying has slowed down because of a lack of available ships. Some neutral nations are unwilling to handle scrap. As high as $17.50 is reported paid for No. 1 steel, delivered Port Richmond. Practically all grades are quoted higher.

Buffalo—Reluctance of dealers to sell at recent prices and higher quotations in adjoining districts have raised the local market 50 cents to $1 on most grades. No. 1 steel is up 50 cents at $16 to $16.50. Mills are fairly well supplied for the present, but consumption is expanding. Scrap inquiries from foundries have increased appreciably.

Detroit—Faced with prospects of a scrap shortage, the market has quickened markedly and prices are up an average of $1.50 a ton. Consumers are in a buying mood and are not inclined to quibble over price. Mills generally have good supplies but do not want to cut into inventories and are disposed to buy before prices go higher.

Cincinnati—Dealers have raised buying prices $1 a ton on most grades in the scramble to augment holdings. Although mills have increased operations, none has come into the scrap market for extensive protection. Buying through the summer has fortified mills fairly well. The most active consumer interest in scrap is among foundries.

St. Louis—Paucity of offerings from all quarters, coupled with a large short interest arising from recent sales of heavy melting steel, has caused a sharp advance in prices here in the most excited market since the last war. Mill purchases the past few weeks exceed 25,000 tons, with delivery specified for the

next 60 days. Price increases range up to several dollars but many quotations are nominal in the absence of a real test.

Toronto, Ont.—Scrap inquiries are increasing, apparently in anticipation of future needs as some consumers are well supplied for the present. Dealers report supplies are coming out slowly, holders anticipating higher values later. Dealer prices are unchanged, but there is talk of increases.

Warehouse

Warehouse Prices, Page 135

Cleveland—Warehouse prices in most instances are expected to be continued into next quarter, in view of recent mill action, although an increase in bars to compensate for higher extras is thought not unlikely. Business shows little change since a month ago.

Chicago—Demand is tending upward, with galvanized sheets particularly active. Warehouses look for some business to develop through extension of mill deliveries, although this condition has not prevailed yet.

New York—Swedish iron rounds, flats and squares have been advanced 2.5 cents a pound to 9.00c for rounds and 9.50c for flats and squares. Prices at Boston are approximately ½-cent higher.

Buffalo—Business is reported the best in about two years, with sheets and bars most active. Some buying has been in anticipation of higher prices, but this expectation largely has been quelled by recent mill announcements.

Cincinnati—Warehouse sales are much heavier as industrial buyers seek to increase inventories against possible price increases. September tonnage may reach 25 per cent over August.

Iron Ore

Iron Ore Prices, Page 136

New York—The foreign ore market remains highly unsettled, although all indications point to sharply increased prices. One recent offering on manganese ore, 50 to 52 per cent grade, figured up to 55 cents per unit, without duty, Atlantic ports, and some quotations on low phosphorus ore figured as high as 19 cents per unit, alongside dock. However, buyers are moving cautiously until they can gage conditions more accurately. Scarcity of boats continues and ocean and war risk insurance rates have been advancing rapidly, with still further changes in early prospect.

Foreign producers, like exporters of steel on this side, are quoting, where they are quoting at all, on the basis of f.o.b. their own properties, thus leaving full responsibility with buyers for transportation.

Eastern local ore producers, anticipating a possible shortage this quarter, are increasing production.

Tungsten ore prices are generally higher, both here and abroad. Chinese wolframite is around $23.75, with domestic scheelite $25.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 133

Bolt and nut prices have been extended into fourth quarter. However, producers are refusing blanket contracts in an attempt to confine sales to actual needs of buyers and are fixing maximum tonnages in new commitments. Prices are stronger, with export quotations up 5 to 10 per cent.

FOR SHOCK LOADS
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Nonferrous Metal Prices

Sept.	Copper Electro, del. Conn.	Copper Lake, del. Midwest	Copper Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
9	12.00	12.00	*	*	*	5.50	5.35	6.00	20.00	12.25	35.00
11	12.00	12.00	*	*	*	5.50	5.35	6.00	20.00	12.25	35.00
12	12.00	12.00	*	*	*	5.50	5.35	6.25	20.00	12.25	35.00
13	12.00	12.00	*	*	*	5.50	5.35	6.25	20.00	12.25	35.00
14	12.00	12.00	12.25	*	*	5.50	5.35	6.25	20.00	12.25	35.00
15	12.00	12.00	12.25	*	*	5.50	5.35	6.25	20.00	13.00	35.00

* Nominal.

MILL PRODUCTS

F.o.b. mill base, cents per lb., except as specified. Copper brass products based on 12.00c Conn. copper

Sheets

Yellow brass (high)	18.65
Copper, hot rolled	20.37
Lead, cut to jobbers	8.30
Zinc, 100 lb. base	11.00

Tubes

High yellow brass	21.40
Seamless copper	20.87

Rods

High yellow brass	13.97
Copper, hot rolled	16.87

Anodes

Copper, untrimmed	17.62

Wire

Yellow brass (high)	18.90

OLD METALS

Nom. Dealers' Buying Prices

No. 1 Composition Red Brass

New York	8.12½-8.25
Cleveland	8.00-8.50
Chicago	8.12½-8.37½
St. Louis	8.50-8.75

Heavy Copper and Wire

New York, No. 1	9.75-10.00
Cleveland, No. 1	9.25-9.50
Chicago, No. 1	9.75-10.00
St. Louis	9.75-10.00

Composition Brass Turnings

New York	7.75-8.00

Light Copper

New York	7.62½-7.87½
Cleveland	7.00-7.50
Chicago	7.87½-8.12½
St. Louis	7.75-8.00

Light Brass

Cleveland	4.50-5.00
Chicago	5.50-5.75
St. Louis	5.00-5.50

Lead

New York	4.85
Cleveland	4.50
Chicago	4.25-4.50
St. Louis	4.00-4.25

Zinc

New York	3.50-3.75
Cleveland	3.25
St. Louis	3.50-3.75

Aluminum

Mixed, cast, Cleveland	7.75-8.00
Borings, Cleveland	6.25-6.50
Clips, soft, Cleveland	14.75-15.00
Misc. cast, St. Louis	8.00-8.25

SECONDARY METALS

Brass ingot, 85-5-5-5, less carloads	13.75
Standard No. 12 aluminum	13.25-13.50

Nonferrous Metals

New York—Only a few price changes were posted in metal markets last week as producers restricted bookings in their attempt to check the frenzied buying wave and soaring price trend of the previous week. Trading was still disorganized and no quotable market existed in tin.

Copper—Producers allocated limited tonnages to regular customers at 12.00c, Connecticut, while resellers quoted 12.50c on the outside market. Casting copper was established at 12.25c, f.o.b. refinery on Thursday while export copper was available on Friday at 12.40c, c.i.f., the first quotations made since Sept. 2.

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Manager

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Single from $2.50
Double from $4.00

DETROIT LELAND HOTEL

CASS AT BAGLEY AVE.
GARAGE IN CONNECTION

Copper and brass rolled product prices were revised upward.

Lead—Heavy buying of lead pigments by South American interests stimulated the pig lead market and sales continued heavy but below the previous week's turnover. Prices held at 5.35c, East St. Louis.

Zinc—Buying pressure lifted but offerings were not made freely in all quarters. Prime western held steady after its advance to 6.25c, East St. Louis, on Tuesday.

Tin—No closing quotations were published but Straits spot sold up to 75.00c and was estimated at around 65.00c at the weekend due to the slump in sterling exchange.

Steel in Europe

Foreign Steel Prices, Page 135

London—(*By Cable*)—Production of steel and iron in Great Britain is intensified, August output being higher than in July and also above August, 1938. However, figures are not available. Government orders have definite priority.

The Continent reports export business has been interrupted. The Belgian export association is prepared to resume sales on the basis of prices prevailing at the beginning of the year. The steel entente is unable to function. Belgium reports an agreement is expected covering continuance of supplies of French ores.

Ferroalloys

Ferroalloy Prices, Page 134

New York—With an increase of $20 a ton in effect on all new business, bringing the market up to $100, duty paid, Atlantic and Gulf ports, ferromanganese shipments this month will be the heaviest since March, 1937, according to leading sellers. Ever since the outbreak of European war, consumers have been increasing specifications against contracts expiring at the end of this month, because of the strong upward trend.

This improvement has also been noted in other alloys, especially those of the manganese group, which within the past week have also been advanced, with silicomanganese up $15 on all grades and manganese briquets up one half cent. Domestic spiegeleisen, 19 to 21 per cent, has been increased $4, to $32 per gross ton, Palmerton, Pa., and 26 to 28 per cent material, $6.50, to $39.50.

Tungsten alloy prices are higher, although difficult to establish at the moment. However, ferrotungsten appears to be holding at about $2.00, tungsten contained and tungsten metal powder at $2.50 in 200-pound drum lots and $2.60 in smaller quantities.

Construction and Enterprise

Ohio

BLUFFTON, O.—Village, W. A. Howe, mayor, plans construction of biological or chemical sewage disposal plant, interceptor sewers along creek banks. Total cost $400,000, sponsor's share $80,000. Village has moved to vote on $80,000 bond issue, Nov. 7. Champe-Finkbeiner & Associates, Nicholas building, Toledo, consulting engineers.

CLEVELAND—City, Frank O. Wallene, director, public utilities department, 105 City Hall, is taking bids to noon, Sept. 29, on delivery, installation of four boiler feed pumps, two distilled water pumps, two heater drain pumps, two booster pumps, two ash sluice water pumps, two main sump pumps, two drip tank pumps, two fan bearing cooling water pumps, two service water pumps, elevator pit sump pump, coal hopper sump pump, two fuel oil pumps, three boiler recirculation pumps, miscellaneous items for complete installation. Five per cent bid bond required.

DAYTON, O. — War department, air corps, Major Don L. Hutchins, constructing quartermaster, Wright field, is taking bids to 11 a. m., Oct. 10, on construction of complete power plant addition to dynamometer building.

DAYTON, O. — War department, air corps, materiel division office of contracting officer, Capt. John G. Salsman, Wright field, is taking bids to 10 a. m., Sept. 25, on 776 hydraulic jacks, three to ten-ton capacity.

GALLIPOLIS, O.—Buckeye rural electric association, O. E. Elliott, president, plans construction of 44 miles transmission line in Lawrence, Gallia counties. Cost $41,000.

ST. MARY'S, O.—Goodyear Tire & Rubber Co., Akron, O., P. W. Litchfield, president, begins erection of mechanical rubber goods manufacturing plant, to employ 400 men, immediately. Plans provide for fireproof structure, to cost more than $1,000,000 with equipment, to be ready for occupancy early in 1940.

Michigan

COLDWATER, MICH.—State, Grover

gets welders' "O.K."

BECAUSE: Hi-Tensile "F" is a fast-running rod. It is quiet and smooth—and has good penetration. Welders find it equally useful on horizontal, vertical and overhead jobs. It is very handy for work in close quarters. Slag and spatter losses are very low.

A weld made with HI-TENSILE "F" has great strength and high ductility—withstands shock exceptionally well. HI-TENSILE "F" is an ideal electrode for jobs in Cro-Man-Sil, Cor-Ten, H.T.-50 and many other new alloy steels.

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BUY ACCO QUALITY *in Page Welding Electrodes, Lay-Set Preformed Wire Rope, Reading-Pratt & Cady Valves, Campbell Cutting Machines, American Chains and Ford Chain Blocks.*

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C. Dillman, 213 State Office building, Lansing, budget director, plans construction of sewage treatment plant, Children's village, will take bids soon.

DETROIT—Smith, Hinchman & Grylls, Detroit, with C. Howard Crane Inc., Detroit, as associate, have been selected to prepare plans for proposed $9,000,000 slum clearance project, to be erected in 26 block area, for Detroit housing commission.

Illinois

CAHOKIA, ILL.—Union Electric Co. of Illinois, subsidiary, Union Electric Co. of Missouri, E. T. Gushee, executive vice president, Twelfth and Locust streets, will install dust collecting equipment on six power plant smokestacks, to cost approximately $1,400,000.

CARLYLE, ILL. — City council has passed ordinance providing $130,000 expenditure for municipal electric plant improvement. New 1000 kilowatt turbine generator, other equipment, to be installed.

Indiana

LINDEN, IND.—Tipmont Rural Electric Membership Corp., Cerl H. Hiatt, superintendent, has secured $480,000 REA grant for construction of 510 miles rural transmission lines in four counties.

MONTICELLO, IND.—White County Rural Electric Membership Corp., Ralph H. Mahin, president, plans construction of 450 miles rural transmission lines in four counties, has $446,000 REA grant.

WANATAH, IND.—Kankakee Valley Rural Electric Membership Corp., Arnold H. Christianson, president, will build 461 miles rural transmission line at cost of $445,000, in five counties.

District of Columbia

WASHINGTON—Chief, division of purchases, sales and traffic, department of agriculture, will take bids until Oct. 6 for a 3-story, four-bay extension to chemical laboratory unit, 65 x 86 feet, northern regional laboratory, to be constructed in Peoria, Ill.

Florida

MIAMI, FLA.—Crowley's Milk Co., Binghamton, N. Y., let contract to J. F. Weatherly, 358 N. W. Twenty-ninth street, for warehouse and cold storage building, one story, 50 x 120 feet, cost $16,000.

PENSACOLA, FLA.—Bureau of yards and docks, navy department, will soon ask bids on circulating loop, screen well, intake and pumphouse, traveling water screen, pumps and piping at naval air station.

PENSACOLA, FLA.—United States industrial Chemical Co., 60 East Forty-second street, New York, has reportedly acquired six acres land in Bayou Chico area, for probable establishment of paint factory.

Georgia

ATLANTA, GA.—Georgia milk confederation, Columbus Roberts, president, Whitehall street, acquired building adjoining present plant. Will raze and erect modern wholesale plant.

DUBLIN, GA. — Ocmulgee Electric Membership Corp., J. L. Allen, president, has $188,000 REA fund for construction of 226 miles rural transmission lines in four counties.

Mississippi

CARTHAGE, MISS.—Central Mississippi Electric Power Ass'n., E. T. Thomas, superintendent, will construct 69 miles rural transmission line, cost $63,000; has secured REA allotment of funds.

North Carolina

MORGANTON, N. C.—Town, B. Bristol Sr., mayor, receives bids Sept. 21 for labor, materials, equipment, for construction of three small sewage treatment plants, Imhoff tank, sludge bed, miscellaneous items. $11,000 available.

South Carolina

CHARLESTON, S. C.—Treating plant, Wood Preserving Corp., was recently destroyed by fire; loss $200,000.

CHARLESTON, S. C.—South Carolina public service authority, room 508, Peoples building, receives bids on or about Oct. 31 for Pinopolis power plant, lock gates, machinery, steel work in Santee-Cooper power and navigation project. Includes three roller head gates and guides, 50 tons each; six sliding head gates and guides, 40 tons each; two sliding tail gates, 30 tons each; two sliding tail-gates, seven tons each; trashrack, 290 tons. In second schedule, for fabrication, delivery, installation: lower lock arch gate, two leaves, 245 tons each; upper lock girder gate, two leaves, 140 tons each; four sets lock gate machinery; four sets lock valve machinery; miscel-

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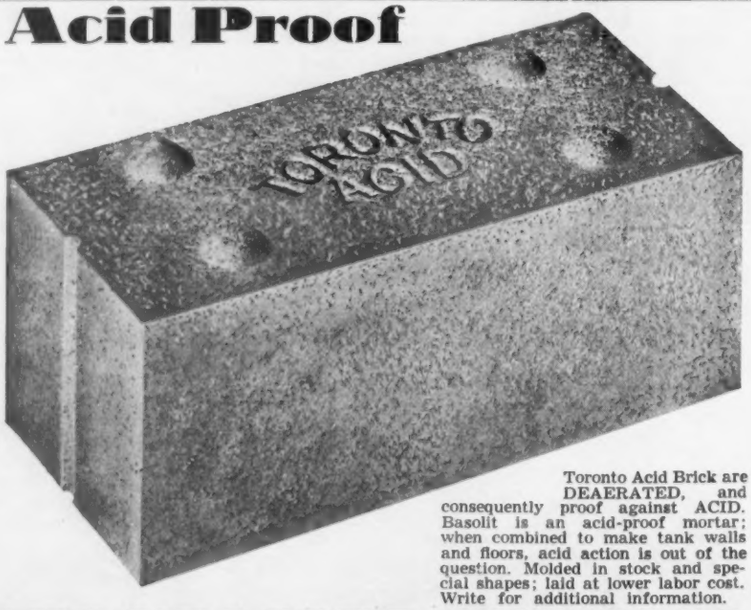

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laneous lock equipment items including towing machines, floating mooring bitts, tainter valves, emergency gate machinery, electric controls, wiring.

PAGELAND, S. C.—Lynches River Electric Co-operative Inc., Frank Blackwell, president, receives bids Sept. 25 for construction of 267 pole miles primary and secondary transmission lines located in Lancaster, Kershaw, Chesterfield counties. Watthour meter project consists of approximately 702 meters, will be handled under centralized purchase plan set up by REA. J. B. McCrary Engineering Corp., Atlanta, Ga., engineers.

Virginia

ALEXANDRIA, VA. — City, Richard Ruffner, mayor, has appointed housing committee, plans erection of more than 100 dwellings; to cost about $500,000.

LYNCHBURG, VA.—Swift & Co., Chicago, local plant 1014 Jefferson street, plan erection of one-story building, 50 x 100 feet.

MADISON, VA.—Northern Piedmont electric co-operative, T. A. Jeffries, superintendent, will build 78 miles rural transmission lines in Culpepper, Fauquier counties, to cost $77,000. Company has REA allotment.

Missouri

LAMAR, MO.—Barton county electric co-operative, John Beall, president, is taking bids to 10 a. m., Sept. 26, on construction of 150 miles rural transmission lines in Vernon, Barton, Jasper counties. Frank Horton, Lamar, consulting engineer.

ST. LOUIS—Union-May-Stern Co. has leased 5-story and basement building; will install additional elevator, belt conveyor system and spiral delivery chute.

Arkansas

JACKSONVILLE, ARK.—First Electric Co-operative Corp., Ben Marshall, superintendent, has $327,000 REA allocation for construction of 395 miles rural transmission line in six counties.

Wisconsin

AMERY, WIS.—Wisconsin Hydro-Electric Co., R. M. Houger, president, plans construction of 3000 kilowatt steam generating plant as soon as state public service commission grants authority.

ASHLAND, WIS. — Marathon Paper Mills Co. has awarded contract for construction of 80 x 100 feet addition to bleach plant division of the mill to Roy J. Murphy, general contractor.

GAYS MILLS, WIS.—Crawford electric co-operative, C. H. Hooverson, superintendent, has been allotted additional $138,000 REA funds for construction of second unit rural transmission lines, comprising 141 miles. Wisconsin Development Authority, Tenney building, Madison, Wis., engineer.

WASHBURN, WIS.—Bayfield county, Ludvig Tranmal, county clerk, will soon start construction of a 1-story county highway shop and maintenance building, 90 x 110 feet. Overhead crane, shop tools to be installed. H. B. Curry, county highway commissioner.

Minnesota

BENSON, MINN.—Stevens-Big Stone power co-operative, A. E. Lee, president, has made supplementary application to REA for funds to finance construction of 348 miles rural transmission lines in Swift, Pope counties. H. S. Bliss, Brainerd, consulting engineer.

MINNEAPOLIS — Minneapolis Star-Journal, John Cowles, publisher, has awarded contract to C. F. Haglin & Sons, 720 National building, for construction of 4-story newspaper publishing plant, 99 x 109 feet; cost $500,000. Many new presses, other printing machinery, equipment, to be installed. Larson & McLaren, Foshay Tower building, architects.

VIRGINIA, MINN. — Northern electric co-operative association, Gust Ardin, president, has $315,000 REA fund for construction of 277 miles rural transmission line.

Texas

ATHENS, TEX.—Kraft-Phenix Cheese Co., 400 Rush street, Chicago, leased former building of Bluebird Canning Co., will remodel for cheese plant.

EDNA, TEX.—Jackson Electric Co-operative Inc., A. L. Burditt, president, has secured $149,000 REA allotment for constructing 180 miles rural transmission lines in Jackson, Matagorda, Calhoun counties.

TIMPSON, TEX.—City, E. L. Hebert, mayor, receives bids Sept. 22 for water well and power units. H. B. Gieb & Co., Mercantile building, Dallas, Tex., engineers.

Kansas

GIRARD, KANS.—Sekan Electric Co-operative Ass'n. Inc., E. F. Schrimsher, superintendent, has $220,000 REA fund for construction of 212 miles rural trans-

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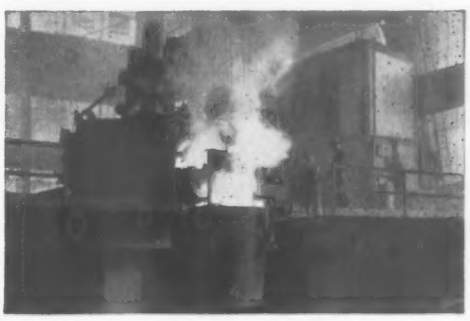

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mission lines in Crawford, Bourbon counties.

North Dakota

FARGO, N. DAK.—Dakota Sash & Door Co., Aberdeen, S. Dak., will start construction soon on new sash and door factory, 50 x 90 feet, and warehouse, 90 x 90 feet, at Fargo. R. M. Michelson, manager.

South Dakota

SIOUX FALLS, S. DAK.—K. V. Hill, Chicago, consulting engineer, has presented report estimating cost of new equipment at city sewage disposal plant at $127,000. Equipment to consist of sludge handling tank, equalizing tank, degreasing equipment, rebuilt filters, pumping machinery. R. E. Bragstad, city engineer.

Iowa

CLINTON, IOWA—E. I. duPont de Nemours Co., Wilmington, Del., is making soil tests on site acquired near here preparatory to erection of large plant for manufacture of cellophane products.

DES MOINES, IOWA—Monroe L. Patzig Laboratories, testing engineers, have started construction of a 1-story testing laboratory addition, 44 x 50 feet.

GREENFIELD, IOWA—Village, O. L. Downing, clerk, is taking bids to 1:30 p. m., Oct. 3, for one 600-700 horsepower diesel engine, complete with generator, exciter, exhaust silencer, waste heat boiler, intake silencer, air filter, day tank, piping. Will trade in 400 horsepower diesel generator. Stanley Engineering Co., Muscatine, Iowa, consulting engineer.

MOSCOW, IOWA—First Iowa hydro-electric co-operative, Harry Strong, manager, has incorporated, filed application with state for authority to construct $3,500,000 dam and hydro-electric project on Cedar river. Power house will be built capable of developing 20,000 horsepower or 15,000 kilowatts.

OTTUMWA, IOWA—Winger Mfg. Co., Lloyd Winger, general manager, has been organized to manufacture sheet metal products, air conditioning ducts, packing house equipment. Production will be started immediately.

WATERLOO, IOWA—Schoitz Engineering Works, O. A. Schoitz, president, plans construction of addition, improvements to machine shop and factory.

Montana

FORT PECK, MONT.—War department, engineers' corps, 1201 Davidson building, Kansas City, Mo., is taking bids to Oct. 2, 11 a. m. on one 16,667 kilovolt-ampere and one 38,889 kilovolt-ampere alternating current generators, auxiliaries. Delivery to be f.o.b. railroad cars, factory shipping point, for installation and testing in power house at Fort Peck. Bid bond 10 per cent required.

MISSOULA, MONT.—Missoula electric co-operative is completing plans for construction of 90 miles rural transmission lines in Powell, Granite, Missoula counties. J. M. Garrison, state water conservation board, Helena, consulting engineer.

Pacific Coast

LOS ANGELES—Building permit has been issued for construction of addition to Harvey Machine Co. plant, 6200 Avalon boulevard. To cost $10,000, ground dimensions, 67 x 140 feet.

LOS ANGELES—J. & B. Safety Tool Co., 833 West Fifty-fourth street, has been granted certificate to conduct business under that firm name. Homer E. Jones, Clinton J. Bacon, owners.

CORVALLIS, OREG.—Portland Gas & Coke Co. will construct 100,000 cubic-foot gas holder, welded steel, to cost $20,000. Contract let to Gabriel Erection Co., Portland, Oreg.

PORTLAND, OREG.—Board of engineers has reported to city council proposed sewage disposal system will cost $10,000,000.

PROSSER, WASH.—Northwestern Natural Gas Co. plans construction of butane gas plant to supplement natural gas supply; cost $12,000. Same company also plans improvements at Toppenish, Wash., plant.

RITZVILLE, WASH.—Big Bend Electric Co-operative Inc., non-profit, has been organized by John S. Gray and others.

SEATTLE—Lake Union Drydock & Machine Co., 1515 Fairview avenue North, is building boiler house.

SPOKANE—City, A. D. Butler, engineer, has revised plans for construction of municipal sewage disposal system, to cost $1,872,000. (Noted July 31.)

Canada

FRANKFORD, ONT.—Bata Import & Export Co. Ltd., 80 King street, Toronto, plans 5-story and basement, 60 x 260 feet shoe factory, one mile east of Frankford.

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READER Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

War Prosperity False

To the Editor:

A change in the neutrality law will, no doubt, mean a lot of business for the United States. Prosperity, however, will be false, for when the whole thing has been settled, we will have a worse depression than the one through which we have just passed. If the law is changed to allow us to sell for cash to all nations, it will mean that we are helping to prolong the conflict, and should we at a later date be drawn into the war, our own soldiers will be killed by the guns, etc., that we have supplied.

It does seem that President Roosevelt is determined to change the law, but why—no one seems to know.

L. R. SEEN

Purchasing Manager,
Borg & Beck Division,
Borg-Warner Corp.,
Chicago

Plan Works in Reverse

To the Editor:

Your comment on the new responsibility assumed by employers in hiring workers, (STEEL, Sept. 18, p. 26) touches a most important factor in the present situation. With manufacturing activity increasing steadily, whether it be on account of expected war business or not, need for more workers is becoming insistent and from the great number of unemployed there are plenty of candidates for the positions.

But, until it appears plain whether the present bulge is permanent and not a short-lived ripple, employers are seeking every means to supply the need with present forces. This is because every new employe at once becomes a candidate for unemployment benefit at the expense of the employer if it becomes necessary to lay him off. Should his term of work be short this imposes a tremendous burden in unemployment tax, which might easily more than wipe out the profit resulting from his work.

The net result of this provision for the benefit of the discharged worker is to limit severely his chances of being employed at all, until it appears that demand for his services will last a sufficient time to make it worth while to add him to the payroll.

It is unfortunate that a plan doubtless designed with good intention as a relief measure should be so framed as to act as a boomerang on chances for improved employment and actually prevent his being taken on when his services are needed.

It would seem that some means might be evolved to preserve the good points of an unemployment provision and yet not penalize the employer too severely for contributing to the relief of the idle worker in such times. This is a problem for the best minds on whom the situation bears. Progress in social affairs is obtained by the cut and try method and alterations to meet conditions are always necessary as we move forward to better levels.

This is a challenge to industry as well as to government to reconcile the conditions and work out a plan that will preserve the good points and do away with the bad.

EMPLOYER

Buffalo

Favors "Hands Off" Policy

To the Editor:

It may for a while be better to change the present existing neutrality laws and allow all nations the privilege of selling warring countries on the "cash and carry" basis since it would probably absorb a lot of our unemployed, but what about the after effects? I rather feel another depression ultimately would result, which may in scope be just as drastic as the one we are about to recover from as a result of the World war, if the present conflict should last as long as the allies seem to be planning for.

Therefore, my personal opinion is, and it's only worth that much, that we had better not become mixed up unless we are willing to suffer the consequences which inevitably will follow. Then, too, there is that probability of actually becoming involved in the conflict, and certainly as a World war veteran, I would not under any circumstances endorse any movement where United States soldiers are asked to fight and die on foreign soil. I personally served in the front line trenches during the World war and I, therefore, know the hardships and the evils that war wrought upon the soldiers and our country as well.

I have endeavored to define my opinion both from actual and business experience, and I hope my remarks may be the means of helping to avert another eight or ten years' period of depression by keeping "hands off" of the present European situation.

J. B. MARQUETTE

Purchasing Agent,
Parish Pressed Steel Co.,
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